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ON THE CORRESPONDENCE OF THE DEGREES OF BEAUMÉ'S HYDROMETERS WITH SPECIFIC GRAVITY.

By Henry Pemberton.

Read at the Pharmaceutical Meeting of the College held September 1st, 1851.

There is no instrument in such general use, and upon whose indications so much depends, that is liable to the variations and gross errors that affect so seriously Beaumés Hydrometers. It is well known that two hydrometers seldom mark like degrees, when plunged into the same liquid, and often vary so greatly that they become utterly useless. This faulty construction is generally attributed to the maker of them, and to some extent with justice, for many are so carelessly made that they will not float upright, or the stem evidently so unequal in diameter as to render it useless to seek for further cause. But it is not so generally known that the value of the degrees of the scale is equally uncertain, and though the hydrometer may be carefully made, there is no standard scale by which to obtain the value of any given degree. It is true that when Beaumé first invented his scale, he had relative values for each degree, but as the system of graduation for upwards of thirty years has been different from that upon which he constructed his instrument, they would be useless for comparison, if obtainable. This is to be regretted, more especially in the case of hydrometers for liquids denser than water, these being most

generally in use, and their scales subject to the greatest variations. Tables of comparison have been made by Delezannes, Francoeur, Bohnenberger, Gilpin, Dr. Ure, Nicholson, Vauquelin et Darcet, and others, but they are all formed from the original scale of Beaumé by calculation, or obtained from direct experiment by taking the sp. gr. of liquids in which the hydrometer sinks to various degrees.

No scale formed from experiments can be depended upon for accuracy, as a proof of which it is impossible to find two scales so formed agreeing, the error often affecting the first decimal place.

The basis upon which Beaumé formed his scale was very unfortunately chosen, and gave rise, at an early period, to changes that have completely modified even the theory of his instrument; he obtained the zero for his scale for light liquids, or pèse esprit, by immersion in water containing ten per cent. of salt in solution, and the point to which it sunk in pure water he made 10°, dividing the stem into like intervals he obtained the 20°, 30°, &c., the intermediate degrees by subdivision. The hydrometer for heavy liquids of pèse acide was differently adjusted. Water gave 0°, and the point to which it sunk in a solution containing fifteen per cent. of salt, he marked as 15°, the interval doubled gave the 30°, the next the 45°, and so on. Now it is evident that if an error is made in obtaining the first interval, it becomes multiplied in extending the scale, and even with the greatest care it would be impossible to obtain two instruments graduated precisely alike; the only reliable plan is to subdivide points obtained at the extremes of the scale, and this has been the practice with the makers since an early period.*

In an article by Francoeur entitled "Areomètre," and published in the Dictionnaire Technologe, at Paris, in 1822, the author says, in speaking of the method of graduation, "This kind of fault is so serious, that the workmen, knowing from the experiments of Guyton that concentrated sulphuric acid should mark 66 B., commonly

* Beaumé also pointed out another "Pèse Sel;" he made several saline solutions—each giving its own degree—5 parts of salt in 95 parts of water gave 5°, 10 parts of salt and 90 parts of water gave 10°, &c., (Dictionnaire Technologe.") This tended to increase the confusion, though it probably never came into general use, as the scale could not be extended beyond 25°.

make use of that liquid for determining the 66° of their standard, and, therefore, are safe in dividing the space between this level and that of water into 66 equal parts. Unfortunately, the author, instead of mentioning the corresponding sp. gr., contents himself with asking, "But was this proof acid well concentrated, and was Guyton's hydrometer properly constructed ?" when he must have known that concentrated oil of vitriol has a density of at least 1.830, (which is so stated in an article in the same work only a few pages back,) while the tables he publishes further on give 1.7674 as = 66°, showing that at that time the same discrepancy existed between the pèse in general use, and the tables of comparison as at the present day.

The modern pèse esprit and pèse acide are entirely different instruments from those invented by Beaumé. The density of a solution containing 15 per cent. of salt is 1.1094, as determined by Francoeur and others, and which I have verified by experiment. Then as the bulk of the hydrometer immersed in liquid is inversely as the sp. gr. of the liquid, it follows that the portion of the hydrometer above water bears the same ratio to its total bulk, that the increase of sp. gr. of the liquid over water does to its real sp. gr. If then the interval on the stem is made equal to a certain number of degrees, the value of any other degree may be readily obtained by the equation $\frac{d\,q}{d-a}=H$ (for the total number of degrees contained in the volume of the hydrometer,) and $\frac{H}{H-q}$ for any given degree, or if the sp. gr. is known and the degree sought for $\frac{H}{d}=H-q$. In the above equations $d=$ greatest sp. gr., $a=$ least sp. gr., or zero, $H=$ value of hydrometers in degrees, and $q=$ the given degree. Making then, $\begin{matrix} a=1000 \\ d=11094 \\ q=15° \end{matrix}$ the equation gives $\frac{1.1094\times15}{1.1094-1.000}=152°=H$ and $\frac{152}{152-q}$ as the formula for Beaumé's original pèse acide.

Professor R. O. M'Culloch in his admirable "Report on Hydrometers," has given tables by Francoeur calculated from the above formula, but which are useless for reference, as the degrees do not correspond with those given by any of the modern hydrometers; for example, making 66° = sp. gr. 1.767, instead of 1.83, which is the sp. gr. of commercial oil of vitriol, requiring $69\frac{1}{2}$° to equal sp. gr, 1.83. As the scale upon which 66° =1.83 has been for many years in such general use, it would be impossi-

ble to supplant it with one giving different though more correct values ; the only thing that can be done is to remove the cause of its errors, and to place it upon a true and scientific basis, by which correct tables may be formed for the value of its degrees, and which, by being recognised as a standard by competent authority, will enable the maker to give it a degree of accuracy now unobtainable.

Beaumé's hydrometer, whether made in England, France, Germany, or this country, have always the 66° equal in strength to commercial sulphuric acid. Nearly all of them are marked with an arrow or other device to show that that is considered the level to which it should sink in the acid; as the maker has no authority by which to decide the proper strength of the acid, it compels him to take for granted that it is of uniform strength, which by no means is the case. Most systematic chemical works unite in stating that it is about 1.843 or 1.845, a degree of concentration rarely met with. The mean of several trials of samples, obtained from full carboys made by three different houses in this city, give a result of 1.8366.

The table published in Wood & Bache's Dispensatory, and which is nearer correct than any other I have met with, gives 66° = 1.8312, taking 1.8354 as the standard sp. gr. for 66° (the advantage of which is that it gives a number without fractions for a modulus,) we have the formula $\frac{145}{145-q}$ for the hydrometer, giving 1.0740 as the sp. gr. for 10°. As 1.0740 differs from 1.0735 (the density given by Beaumé's 10 per cent. solution,) only by $\frac{5}{10,000}$ it is evident the manner in which the present scale has come into use. The makers noticing that 10 per cent. salt gave 10°, and 15 per cent. 15°, erroneously thought that 10° of one scale was equal to the 10° of the other, and to save the trouble of preparing two solutions, substituted the 10 per cent. for the 15 per cent. This probably was the case before the density of commercial acid was established at its present strength, and, therefore, would not attract attention by the error.

If, then, 1.0740 is recognised as the standard sp. gr. for 10° B., 1.8354 will be the sp. gr. corresponding to 66°, and if the instrument maker takes proper care in ascertaining that his acid is of

the above sp. gr., each degree can be obtained by dividing the space, and their value determined by the equation $\frac{145}{145-q}$, enabling any one to prove the correctness of a hydrometer, and furnishing tables that cannot differ or contain any source of error.

The pèse esprit has suffered even greater changes. It is much to be regretted that the same modulus cannot be used for both instruments, but it would produce so great a change if attempted, that the confusion arising from it would more than counterbalance its advantages. Beaumé's 10 per cent. salt solution was used by him for the zero, (sp. gr. 1.0735,) and water for the tenth degree (sp. gr. 1.000,) of the scale. The formula $\frac{d \times q - 10}{d - a} = H$, gives 146 as the modulus for his hydrometer. The table formed from this (the true Beaumé's pèse esprit,) differs entirely from the one now in use; a comparison of several scales further on will show the change.

The scale most frequently met with approaches the one formed from the modulus 140, and is the one given in Wood & Bache's Dispensatory, and from being so generally in use, is often considered the standard; its modulus, however, is irregular and therefore erroneous. A curious fact connected with this scale, and which has probably led to its adoption, is the close correspondence with its values and those of Cartier's scale, as obtained by making 22° of Cartier's equal 22° of Beaume's original 146 modulus scale, and subdividing every 15° Beaumé into 16, (Cartier's plan.) Many of the higher numbers of the scale correspond exactly with the modern scale, (modulus 140) and all of them are within half a degree of being identical. It is, therefore, useless to publish tables for reducing Cartier to Beaumé, the so-called Beaumé's scale being in reality as near the original Cartier scale, as the different instruments made by Cartier himself were to each other. It is surprising that the above coincidence has escaped notice so long. Liebig and Poggendorf's "Handwoörterbuch der Chemie," contains tables placed near each other which almost coincide, and yet no notice is taken of it and the rule given to reduce the scales, when the reduction would only remove them two or three degrees apart.

To recapitulate, the position of the pèse esprit at present is as follows. Beaumé constructed a scale upon the modulus 146.

Cartier supplanted him with a poor instrument of his own, formed experimentally, and with no definite modulus, but approaching nearest to the scale given by the modulus 140. In course of time Cartier's scale became confounded with Beaumé's, the title "Beaumé's" being applied to an extension of Cartier's, (it extending originally only to 44°,) and the real Beaumé's scale entirely lost sight of. The formula for converting Beaumé's degrees into Cartier's is still published with all the tables, though worse than useless. The instruments made in France are generally marked "selon Cartier," and are so in reality, but differ in no respect from the common instrument known as Beaumé's hydrometer.

To remove the difficulty and confusion attending their use, and to restore to both their real value, it is only necessary for some competent authority to determine a modulus for each scale, which should be, from the reasons already given, 145 for the pèse acide, and 140 for the pese esprit, (taking the 10 per cent. solution for zero.) The value so given for the 66th degree of the former scale, and the 60th of the latter, would determine the sp. gr. for the extremes of the scale, and each degree between obtained by division. Ether of sp. gr. .7368, temp. 60 F., is easily obtainable, and would furnish the 60th degree of the pese esprit, the higher degrees on each scale could then be readily laid off in the usual manner. If the united colleges in this country would adopt this system, (or any other if better,) Beaumé's hydrometer would become as valuable for its accuracy in determining specific gravities, as it is for its convenience; as any desired delicacy could be given to its indications, to the one-tenth of a degree if desirable.*

[* The Philadelphia College of Pharmacy, deeply impressed with the real importance and usefulness of reliable hydrometers to the pharmaceutist and the manufacturer, have under consideration the propriety and feasibility of having a supply of these instruments carefully made, according to the data furnished by Mr. Pemberton, under the supervision of a competent committee, who will only give the authority of the College to such of the hydrometers as shall pass their inspection, after trial.—EDITOR.]

Table for Liquids lighter than Water.

	Modulus 140, 60° F.	Wood & Bache Disp'y.	Francoeur	Delezennes	Turner. 35 F.	Cartier by Fran'r.	Cartier by Delez's.
10	1.0000	1.0000	1.0000	1.0000	1.000		
11	0.9929	0.9930	0.9932	0.9929	0.990		1.0000
12	0.9859	0.9861	0.9865	0.9859	0.985		0.9922
13	0.9790	0.9792	0.9799	0.9790	0.977		0.9846
14	0.9722	0.9724	0.9733	0.9722	0.970	0.9764	0.9771
15	0.9655	0.9657	0.9669	0.9655	0.963	0.9695	0.9697
16	0.9589	0.9591	0.9605	0.9589	0.955	0.9627	0.9624
17	0.9523	0.9526	0.9542	0.9524	0.949	0.9560	0.9552
18	0.9459	0.9462	0.9480	0.9460	0.942	0.9493	0.9481
19	0.9395	0.9399	0.9420	0.9396	0.935	0.9427	0.9412
20	0.9333	0.9336	0.9359	0.9333	0.928	0.9363	0.9343
21	0.9271	0.9274	0.9300	0.9272	0.922	0.9299	0.9275
22	0.9210	0.9212	0.9241	0.9211	0.915	0.9237	0.9208
23	0.9150	0.9151	0.9183	0.9151	0.909	0.9175	0.9143
24	0.9090	0.9091	0.9125	0.9091	0.903	0.9114	0.9078
25	0.9032	0.9032	0.9068	0.9033	0.897	0.9054	0.9014
26	0.8980	0.8974	0 9012	0.8975	0.892	0.8994	0.8951
27	0.8917	0.8917	0.8957	0.8918	0.886	0.8935	0.8889
28	0.8860	0.8860	0.8902	0.8861	0.880	0.8877	0.8827
29	0.8805	0.8804	0.8818	0.8806	0.874	0.8820	0.8767
30	0.8750	0.8748	0.8795	0.8751	0.867	0.8763	0.8707
31	0.8695	0.8693	0.8742	0.8696	0.861	0.8707	0.8649
32	0.8641	0.8638	0 8690	0.8643	0.856	0.8652	0.8590
33	0.8588	0.8584	0.8639	0.8590	0.852	0.8598	0.8533
34	0.8536	0.8531	0.8588	0.8537	0.847	0.8545	0 8477
35	0.8 84	0.8479	0.8538	0.8486	0.842	0.8491	0.8421
36	0.8433	0.8428	0.8488	0.8435	0.837	0 8439	0.8366
37	0.8383	0.8378	0.8439	0 8384	0.832	0.8387	0.8312
38	0.8333	0.8329	0.8391	0.8334	0.827	0.8336	0.8258
39	0.8284	0.8281	0.8343	0.8285	0.822	0.8286	0.8205
40	0.8235	0.8233	0.8295	0.8236	0.817		0.8153
41	0.8187	0.8186	0.8249	0.8188			0.8101
42	0.8133	0.8139	0.8202	0.8141			0.8050
43	0.8092	0.8093	0.8156	0.8094			0.8000
44	0.8045	0 8047	0.8111	0.8017			
45	0.8000	0.8001	0 8066	0.8001			
46	0.7954	0.7956	0.8022	0.7956			
47	0.7909	0.7911	0.7978	0.7911			
48	0.7865	0.7866	0.7935	0.7866			
49	0.7821	0.7821	0.7892	0.7823			
50	0.7777	0.7777	0.7849	0.7779			
51	0.7734	0.7733	0.7807				
52	0.7692	0.7689	0.7766				
53	0.7650	0.7646	0.7725				
54	0.7608	0.7603	0.7684				
55	0.7567	0.7560	0.7643				
56	0.7526	0.7518	0.7604				
57	0.7486	0.7476	0.7565				
58	0.7446	0.7435	0.7526				
59	0.7407	0.7394	0.7487				
60	0.7368	0.7354	0.7449				
61	0.7329	0.7314					
62	0.7290	0.7251					
63	0.7253						
64	0.7216						
65	0.7179						
66	0.7142						
67	0.7106						
68	0.7070						
69	0.7035						
70	0.7000						

The formula $\frac{a \times q - 10}{d - a} = H$ gives the modulus for any scale when the degree and sp. gr. are known. And $\frac{H}{H - 10 + q}$ gives the specific gravity.

Carter's scale by Francoeur, is from the original Beaumé, by the formula $15C = 16B \pm 22$, and Delezenne's by the same formula, from the modified instrument now in use.

Turner's authority is not given, but the scale coincides with Gilpin's; it is utterly worthless, the modulus varying from 128 to 134; it was made by experiment.

Table for Liquids denser than Water.

	Modulus 145. 60° F.	Woods & Bache Disp'y.	Franc'r mod. 152.	Delezennes.	Bohnenberge	Gilpin
1	1.0069	1.0070	1.0066	1.0072	1.077	
2	1.0139	1.0111	1.0133	1.0145	1.013	
3	1.0211	1.0213	1.0201	1.0219	1.020	1.020
4	1.0283	1.0286	1.0270	1.0294	1.027	
5	1.0357	1.0360	1.0340	1.0370	1.033	
6	1.0431	1.0435	1.0411	1.0448	1.040	1.040
7	1.0507	1.0511	1.0483	1.0526	1.047	
8	1.0583	1.0588	1.0556	1.0606	1.055	
9	1.0661	1.0666	1.0630	1.0687	1.062	1.064
10	1.0710	1.0745	1.0704	1.0769	1.069	
11	1.0820	1.0825	1.0780	1.0853	1.077	
12	1.0902	1.0906	1.0857	1.0937	1.084	1.089
13	1.0984	1.0988	1.0935	1.1023	1.092	
14	1.1068	1.1071	1.1014	1.1111	1.099	
15	1.1153	1.1155	1.1095	1.1200	1.107	1.114
16	1.1210	1.1240	1.1176	1.1290	1.115	
17	1.1328	1.1326	1.1259	1.1382	1.123	
18	1.1417	1.1414	1.1313	1.1475	1.132	1.140
19	1.1507	1.1504	1.1428	1.1570	1.140	
20	1.1600	1.1596	1.1515	1.1666	1.148	
21	1.1693	1.1690	1.1603	1.1764	1.157	1.170
22	1.1788	1.1785	1.1692	1.1864	1.166	
23	1.1885	1.1882	1.1783	1.1965	1.174	
24	1.1983	1.1981	1.1875	1.2068	1.183	1.200
25	1.2083	1.2082	1.1968	1.2173	1.192	
26	1.2184	1.2181	1.2063	1.2280	1.201	
27	1.2288	1.2288	1.2160	1.2389	1.211	1.230
28	1.2393	1.2394	1.2258	1.2499	1.220	
29	1.2500	1.2502	1.2358	1.2612	1.230	
30	1.2608	1.2612	1.2159	1.2727	1.239	1.261
31	1.2719	1.2724	1.2562	1.2814	1.249	
32	1.2831	1.2838	1.2667	1.2962	1.260	
33	1.2946	1.2954	1.2773	1.3083	1.270	1.295
34	1.3063	1.3072	1.2881	1.3207	1.281	
35	1.3181	1.3190	1.2992	1.3333	1.291	
36	1.3302	1.3311	1.3103	1.3461	1.302	1.333
37	1.3125	1.3134	1.3217	1.3592	1.313	
38	1.3551	1.3559	1.3333	1.3725	1.325	
39	1.3679	1.3686	1.3151	1.3861	1.336	1.373
40	1.3809	1.3815	1.3571	1.3999	1.347	
41	1.3942	1.3947	1.3694	1.4141	1.359	
42	1.4077	1.4082	1.3818	1.4285	1.371	1.414
43	1.4215	1.4219	1.3945	1.4433	1.384	
44	1.4356	1.4359	1.4074	1.4583	1.396	
45	1.4500	1.4501	1.4206	1.4735	1.408	1.455
46	1.4616	1.4615	1.4339	1.4893		
47	1.4795	1.4792	1.4476	1.5053		
48	1.4949	1.4912	1.4615	1.5217		1.500
49	1.5101	1.5096	1.4758	1.5384		
50	1.5263	1.5253	1.4902	1.5555		
51	1.5125	1.5113	1.4951	1.5730		1.547
52	1.5591	1.5576	1.5200	1.5909		
53	1.5760	1.5742	1.5353	1.6092		
54	1.5934	1.5912	1.5370	1.6279		1.594
55	1.6111	1.6086	1.5671	1.6471		
56	1.6292	1.6264	1.5833	1.6667		
57	1.6177	1.6146	1.6000	1.6868		1.659
58	1.6666	1.6632	1.6170	1.7074		

Delezenne's table is from the modulus 140.

Bohnenberger's table is very irregular, having been formed from experiment, the modulus of various parts of the scale differing very much. Gilpin's table is in the same condition. The modulus corresponding to several degrees of each are given as instances.

Bohnenberger. D.	M.	Gilpin. D.	M.
10°	154.3	9°	149.5
15°	156.1	15°	146.5
18°	146.7	27°	144.3
20°	155.1	36°	141
30°	155.2	48°	144
40°	155.28	66°	143.8

	Modulus 145. 60° F.	Wood& Bache Disp'y.	Franc'r mod. 152.	Delezennes	Bohnenberger	Gilpin
59	1.6860	1.6823	1.6344	1.7285		
60	1.7058	1.7019	1.6522	1.7501		1.717
61	1·7261	1.7220	1.6705	1.7722		
62	1.7469	1.7427	1.6889	1.7950		
63	1.7682	1.7640	1.7079	1.8184		1.779
64	1.7777	1.7858	1.7273	1.8423		
65	1.8125	1.8082	1.7471	1.8669		
66	1.8354	1.8312	1.7674	1.8922		1.848
67	1.8589	1.8548	1.7882	1.9180		
68	1.8831	1.8790	1.8095	1.9417		
69	1.9079	1.9038	1.8313	1.9721		1.920
70	1.9333	1.9291	1.8537	2.0003		

REMARKS ON THE PREPARATION OF SOME OF THE SALTS OF MANGANESE.

By W. W. D. Livermore.

Manganese as a remedial agent has repeatedly attracted the attention of physicians, but for reasons not clearly stated has as often fallen into disrepute.

Lately, however, it has been again revived, and brought more prominently into notice by M. Hannon.* This gentleman recommends several forms in which it may be prescribed with advantage particularly the sulphate, carbonate, tartrate, phosphate, and iodide; and as this metal enters into the human organism, we have reason to suppose that, like iron, some one or other of its combinations might frequently be used with success in the treatment of disease.

The manganese preparations possess advantages over those of iron, in being free from astringency, and compatible with astringent vegetable infusions and extracts, and consequently, affording the practitioner facilities for exhibiting it in ccnjunction with other substances, and by these means enlarging its sphere of usefulness.

The salts of manganese though numerous, may all be obtained either directly or indirectly from the sulphate, and therefore it becomes a desirable object to discover the best and most expeditious process by which this salt may be obtained.

* See vol. xxii, Page 297 of this Journal.

Mr. Phillips, (Journal of Pharmacy, vol. xii, p. 57,) recommends suspending deutoxide of manganese in water, and then to pass through it a stream of of sulphurous acid gas; thus reducing the deutoxide to protoxide, and converting the sulphurous acid, into sulphuric and hyposulphuric acids: which, uniting with the manganese, and forming soluble salts, are dissolved by the water. Prepared in this way the sulphate is contaminated with a certain amount of hyposulphate, this difficulty is obviated by boiling the solution for some time, previous to evaporation.

Another method, however, I have found to succeed better. It is to mix in a sand crucible, the black or deutoxide of manganese, with sulphuric acid, until of a thick pasty consistence; cover with a smaller crucible, and expose the mixture to a red heat for half an hour. At the end of this interval, remove the crucible from the fire, and when cool, reduce the dark brown mass to a coarse powder. Introduce this powder into another crucible, and saturate as before with sulphuric acid. Again apply heat and continue it until white vapors cease to be expelled. By these means we obtain a heavy compact mass, of a light gray color, intermixed with red; possessing at first a pungent, but immediately followed by a sweetish, slightly astringent taste; and soluble to a great extent in water. The next step of the process is to reduce this impure sulphate to a *fine* powder, and to dissolve the soluble matter, with successive portions of water. The solution should be filtered into a porcelain capsule, and placed over a sand bath to heat. When nearly boiling, drop into it carbonate of manganese in small portions at a time, until all the iron shall have been precipitated, and the liquid from having been of a dark red, assumes a pale rose tint. Filter and evaporate to the consistence of thin syrup, and set aside to crystallize by spontaneous evaporation. It requires from one to two weeks to accomplish nicely.

When the object is to make other preparations than the sulphate, it saves both time and trouble to proceed a little differently from this. Thus, instead of filtering the solution of the substance left after the second incineration, (a process extremely tedious) it is better to *heat* it at once, and to add bi-carbonate of soda in successive portions of an ounce or two at a time, stirring the mixture, until the iron is wholly precipitated, and a small part of the liquid, on being removed and filtered, appears of the appro-

priate rose color. Remove from the fire, and pour the contents of the vessel into a linen strainer stretched over a frame, returning the solution as it passes through until perfectly transparent and free from sediment.

Bi-carbonate of soda added to this purified solution, throws down a copious precipitate of carbonate of manganese. For use it must be well washed with hot water, collected and suspended to drain for twenty-four hours, and dried over a water or sand bath ; if the latter, care must be taken not to have the temperature too high ; it should not exceed that of boiling water, else the product will be dark.

The carbonate when properly prepared is in the form of a heavy white powder, insoluble in water but dissolving readily in sulphuric acid.

The syrup of the iodide of manganese may be conveniently prepared by dissolving 330 grains iodide of potassium, and 264 grains tartaric acid, each separately in one and a half fluid ounces of water. Mix the solutions, and filter and saturate the resulting hydriodic acid with the carbonate of manganese ; again filter, and add sufficient simple syrup to make the whole measure f.℥vi. This syrup contains fifty grains of solid iodide in each fluid ounce ; is permanent in composition, and compatible with vegetable infusions and syrups, these properties giving it much advantage over the corresponding preparations of iron.

The equivalent of iodide of manganese, assuming it to be an anhydrous salt, is 154. Consequently each ounce of the syrup contains 40½ grains of iodine and 9½ of manganese.

Carbonate of manganese digested in a concentrated solution of tartaric acid, is decomposed, and a tartrate is the result. This should be well washed to free it from any excess of acid, and dried with a gentle heat. It should be perfectly white, insoluble in water, but soluble without residue in concentrated muriatic acid.

Phosphate of manganese is most readily prepared by adding to a solution of the sulphate of manganese, one of alkaline phosphate of soda. A solution of phosphate of soda suitable for this purpose is cheaply prepared by digesting 5lbs. bone black, with 3lbs. sulphuric acid, diluted with one gallon of water, for twenty-four hours, occasionally stirring the mixture. At the end of this interval, separate the liquid portion, and saturate to excess with bi-carbonate

of soda ; a precipitate ensues. This must be removed by filtration. and the solution is then ready for use.

Iron, as an impurity, is always associated with native oxide of manganese, and when that substance is acted on by acids, giving rise to salts of the protoxide ; the iron also unites with them and forms soluble compounds, and it becomes necessary to get rid of it by subsequent precipitation. This is facilitated by its showing less inclination to remain in saline combination, than the oxide of manganese ; and consequently by taking advantage of this property, these metals can be readily separated when in solution, by heating in contact with carbonate of manganese or soda. The whole of the iron by these means is thrown down, and then by filtering, and using a larger quantity of bi-carbonate of soda, carbonate of manganese can be obtained pure.

ON SCUTELLARIA LATERIFLORA.

To the Editor of the American Journal of Pharmacy.

Respected Friend,—The article in the last No. of the Journal, page 370, by C. H. Cleaveland, M. D., on Scutellaria lateriflora, calls to mind some of my experience, coinciding with his, which I offer in hopes it may prove a benefit to some of the afflicted ; and because a remedy which is not much known, or has but little reputation, requires testimony in its favor to call it into notice.

About twenty-five years ago my wife had quite a severe attack of tic doloureux on one side of her face, and as the scullcap had been a good deal spoken of as a remedy for hydrophobia, I determined to try it in this case, supposing its influence to be exerted on the nervous system. By the use of two or three pints of infusion, made with an ounce of the herb to a pint of boiling water and taken in doses of a wine-glassful three or four times a day, the disease appeared to be entirely relieved : in the course of a week or ten days, however, it returned, when the scullcap infusion was again resorted to, and continued several weeks, after which there was no return of the disease on that side. A few years after this period my patient was attacked on the other side of her face, but the diligent use of the scutellaria, as before, soon relieved her, and she has, ever since, remained free from that painful disease.

I have advised this remedy in other cases of tic doloureux, and it has had equal success in some, while in others it has failed. I have also given it in cases of tremor, from the abuse of alcoholic drink, with happy effect, and in one case of great depression of spirits produced by dyspepsia. As to the after effect of this nervine, my observation corresponds with that of Dr. Cleaveland.

Respectfully, WILLIAM STABLER.

Alexandria, Virginia, 10th mo. 18th, 1851.

ON HYDRANGEA ARBORESCENS.

By JOSEPH LAIDLEY, of Richmond, Virginia.

Few subjects of medical interest have claimed more of the time and talents of the medical profession, than has the formation and removal of stone in the bladder ; and of the numerous agents which from time to time have arisen into notice as solvents or preventives, nearly all have fallen into merited disrepute, and left the field almost wholly to the surgeon. It is not so much with the disease, as viewed in reference to the presence of stone in the bladder, that the experimental therapeutist has cause to hope for success in finding a remedy, as in combating and removing that peculiar diathesis upon which the formation of stone supervenes, and thus preventing that terrible necessity of a resort to the lithotriptor or the gorget.

The object of the present paper is to call attention to one of our indigenous plants, the Hydrangea arborescens, in so far as its botanical and chemical characteristics are concerned. The root of this plant was first used with great success by Dr. E. Butler, a missionary to the Cherokee Indians—a situation where, from the liability of the Indians to stone in the bladder, a wide field for testing its virtues was afforded. Dr. S. Worcester Butler, of Burlington, N. J., son of the missionary, introduced it to the notice of the medical profession—(New Jersey Medical Reporter, Oct. 1850 p. 44—47.) Dr. E. Butler employed it in the form of a syrup, made either with sugar or honey ; Mr. E. Parrish of Philadelphia prepares a fluid extract of it, which is probably the

best form for administering it. The plant has been employed with, we believe, considerable success by Dr. John Neill of Philadelphia, and by several other physicians.

"The effect of the plant," says Dr. S. W. Butler, "is to remove by its own specific action on the bladder, such deposits as may be contained in that viscus, provided they are small enough to pass the urethra. It has seemed also to have the power of alleviating the excruciating pain attendant on the passage of a calculus through the ureter."

It will be observed that the power of curing stone in the bladder is not claimed for it; it is only while the deposits are small, when in that stage of the disease known as gravel, that it is an efficient remedy; then by removing the nucleus, which if allowed to remain in the organ should increase in size and form stone, the disease is averted, and when employed at this stage, it is said to have proved beneficial in every instance, and "as many as 120 calculi have been known to come from one person under the use of this medicine." (*N. J. Med. Rep.*)

The desire of investigating the chemical constitution of a remedy which promises to be so valuable, induced the writer, some time ago, to undertake a proximate analysis of the root, a portion of which Dr. Butler kindly placed in his possession, but the quantity proved too small to afford satisfactory results, subsequently another supply was obtained from an examination of which the present results were chiefly drawn.

Hydrangea arborescens is an elegant indigenous shrub, known throughout the Southern and Middle States, where also it flourishes, growing abundantly on the sides of hills and mountains, and along the banks of streams: it is quite abundant in the Susquehanna and Schuylkill vallies. The flowers are often met with in boquets in the markets of Philadelphia. The root is the part that has been employed: it is formed of numerous radicles, sometimes not larger than a goose quill, sometimes half an inch or more in diameter, and these run often to a considerable length. They proceed from a caudex which sends upwards numerous divergent branches, which attain the height of from three to six feet. The root, when fresh, is very succulent, and can easily be cut, but when dry is very tough and resistant, for which reason Dr. Butler recommends that it should be cut up into short transverse sections

while it is fresh, which treatment also facilitates its drying. The bark of the dried root has a rather sharp, aromatic, not unpleasant taste, somewhat resembling cascarilla bark.

The following botanical description of the plant is from Gray's Manual of the Botany of the Northern United States.

NATURAL ORDER.—Saxifrageæ. Suborder Hydrangeæ. Sexual System. Decandria Digynia.

Generic characters.—Shrubs: leaves opposite, petals valvate in the bud, pistils fewer than the petals, a division of the calyx (usually two, united below, and separating at the top;) and the petals with the stamens (mostly 5—10) inserted on the calyx, which is free or more or less adherent to the ovary. Calyx withering, persistent. Petals rarely none. Pods several, many seeded. Seeds small anatropous, with a slender embryo in the albumen.

The *essential characters* are calyx-tube hemispherical, 8—10 ribbed, coherent with the ovary; the limb 4—5 toothed, ovate. Stamens 8—10 slender. Pod crowned with the two divergent styles, 2-celled below, many seeded, opening by a hole between the styles. Shrubs with opposite petioled leaves, and numerous flowers in compound cymes. The marginal flowers are usually sterile and radient, consisting merely of a membraneous coloured, flat, dilated and showy calyx. (The name is from Greek words signifying *water* and *vase*, probably in allusion to the vase-like shape of the pods.)

Specific characters.—Smooth, or nearly so; leaves ovate, rarely heart-shaped, pointed, serrate, green both sides; cymes flat. Rocky banks of northern Pennsylvania (on the Susquehanna, Carey,) and southward. Flowers, which appear in July, often all fertile, rarely all radient like the *garden hydrangea.*

CHEMICAL EXAMINATION.

1. A portion of the root was allowed to macerate in cold water for twenty-four hours, and transferred to a flask, which was then connected with a Liebig's condenser; heat cautiously applied by means of a sand bath. The distilled water was several times returned and redistilled, but the product, although highly charged with the odour of the plant, was tasteless and offered no indication of oil.

2. 500 grains of the powdered root were macerated in 4 ounces of ether for two days, introduced into a percolator, and ether added till 8 ounces of ethereal tincture were obtained. This was reduced to half an ounce by spontaneous evaporation, and afterwards to the consistence of an extract by a water bath below 100° F. Soon after the application of the water bath heat, the clear, pale, yellow liquid separated into a yellow flocculent substance and a colorless liquid, on which it floated. The extract as thus prepared, which amounted to 4 per cent. of the root, was of a light straw color, resinous, soft, but somewhat granular, as extract of quassia often occurs; the after impression, however, is sweetish. The extract consists almost wholly of the yellow flocculent matter above noticed. It is soluble in alcohol, ether, and solution of potassa, which last deepens its color, the solution having a light orange hue. This extract is insoluble in chloroform and in water, contains no fixed oil, and two grains of it when swallowed produced no sensible effect. It is probably soft resin.

3. 500 grains of the root, in powder, were treated with alcohol (85 per cent.) by maceration and displacement, to obtain eight ounces of tincture, which was evaporated at a heat below 120° F. to an extract. Near the end of the evaporation, small globules separated on the surface of the liquid, and remained unmixed in the extract. The alcoholic extract has a light brown color, an odor resembling that of the root, a bitter somewhat sweetish taste, and is but partly soluble in water. The root yielded 6 per cent.

4. 1000 grains of the root from which the matters soluble in alcohol and ether had been extracted, were boiled in several successive portions of water, the decoctions mixed, filtered and evaporated, yielding 65 grains of aqueous extract which had a brown color, slightly bitter taste, no odor, and easily reduced to a powder, resembling jalap in color.

5. A cold aqueous infusion was prepared and found to be neutral to test papers.

I. *Gum* was precipitated by subacetate of lead and by alcohol.

II. *Albumen* was indicated by corrosive sublimate and by coagulation by heat. A solution of gelatin gave no evidence of tannin.

III. *Starch.* The unexhausted dregs from the cold infusion

boiled in water afforded a liquid which, after cooling, yielded a blue color with iodine.

IV. A decoction of the root was boiled with carbonate and muriate of ammonia to remove any lime that might be present, and filtered. This liquid was rendered milky by antimoniate of potassa in solution, and by standing a slight precipitate occurred indicative of *soda*.

V. Sulphuric acid caused a precipitate in the decoction.

VI. A portion of decoction freed from lime, as in IV, yielded slight precipitates with phosphate of soda, and solution of ammonia, occasioned by *magnesia*.

VII. Chloride of barium produced a precipitate only partly soluble in nitric acid.

VIII. An alcoholic solution of bichloride of platinum indicated the presence of potassa.

The decoction, owing to the large proportion of starch which it contains is always very thick; made in the proportion of an ounce to half a pint, it resembles syrup in consistence. The extracts are all deliquescent, absorbing after a time almost sufficient moisture to render them semi-fluid. Several experiments were made with the view of ascertaining the presence of an alkaloid.

1. By making an acidulated aqueous infusion, neutralizing with ammonia, precipitating by tannic acid, the precipitate washed and mixed with hydrate of lime, dried and powdered. This powder was treated with boiling absolute alcohol, and the alcoholic liquid evaporated. A yellow, apparently amorphous matter resulted, but in too small amount to admit an investigation of its properties.

2. 10,000 grains of the root in coarse powder, was macerated in water for twenty-four hours, it was then boiled twice successively for twenty minutes in twelve pints of water, the decoctions strained, mixed and evaporated in a water-bath to a syrupy consistence. The dregs from the decoction were next treated with one gallon of alcohol, 95 p. c., and then with one quart of ether by displacement; these tinctures were reduced to a syrupy consistence, mixed with the aqueous extract, and the evaporation continued till the alcohol and ether were dissipated. The extract as thus prepared was divided into three portions.

3. One portion of extract, 2, was mixed with 250 grains of calcined magnesia, and digested on a sand-bath for four hours, it was then thrown on a filter, washed and dried; the result, exclusive of loss, weighed 260 grains; of (*a.*) this powder 100 grains was placed in a flask and boiled twice successively in one and a half fluid ounce of chloroform, the liquid was filtered and evaporated below 180°, yielding a soft, resin-like substance, weighing one and a half grains; it is soluble in alcohol, and is neutral to turmeric and litmus.

4. 100 grains of the powder (3) was treated as in the last experiment, using absolute alcohol instead of chloroform—the result was a soft resinous substance, resembling 3*a.*, weighing two grains, soluble in chloroform, partly soluble in ether, neutral to litmus and turmeric.

5. One third of the extract, 2, was boiled for one hour, with four ounces of solution of potassa, three ounces of chloroform were added, and the boiling continued a few minutes longer; after the chloroform had subsided, it was separated from the supernatant liquid, and allowed to evaporate spontaneously. An extract like substance resulted, weighing twenty grains, sparingly soluble in ether and alcohol, neutral to turmeric and litmus.

These results tend to prove the absence of an alkaloid; the matters obtained as above, are almost wholly soft resin, and proved, except 1, to be inert, when tried by the writer upon himself.

Examination of the Ashes.

(*a.*) 2000 grains of the root were incinerated in a crucible, yielding 100 grains of an almost white ash.

(*b.*) Thirty-three and a third grains of the ashes were displaced with boiling distilled water, till all the salts soluble in that menstruum were dissolved: the solution was alkaline to turmeric, and reddened litmus papers, and, on evaporation, yielded seven grains, or twenty-one per cent. of a white saline matter.

(*c.*) To three grains of the latter was added one ounce of distilled water, but this quantity being insufficient to dissolve it, a few drops of muriatic acid was added, which caused a perfect solution. The acid caused a brisk effervescence, and the evolution of an odorless gas, showing the presence of carbonates.

(*d.*) The addition of hydrosulphuric acid to *c*, followed by heating, caused no precipitate.

(*e.*) To *c.* was added solution of ammonia until an alkaline reaction was induced, when the addition of hydrosulphate of ammonia caused a white precipitate.

(*f.*) The addition of phosphate of soda and solution of ammonia, caused a white precipitate in *d*, probably of *lime.*

(*g.*) To *c.* was added some carbonate and solution of ammonia, the latter in excess; on boiling the mixture, a copious white precipitate was occasioned; this was washed, separated by filtration and dissolved in weak muriatic acid, in which the addition of solution of ammonia and oxalic acid caused a precipitate of *oxalate of lime.*

(*h.*) The liquid *c.* gave a yellow precipitate on the addition of an alcoholic solution of bichloride of platinum, indicative of *potassa* in small amount.

(*i.*) The liquid *c.* was neutralized with bicarbonate of potassa and solution of antimoniate of potassa added, a precipitate was occasioned indicating the presence of *soda.*

(*j.*) Nitrate of silver added to an aqueous solution of *b.* produced a yellow precipitate, soluble in nitric acid; chloride of barium and subacetate of lead, occasioned white precipitates; that by the first being soluble nitric and muriatic acids, and that by the lead salt, soluble in nitric acid.

(*k.*) The residue of the ashes undissolved by water was tested with water acidulated with muriatic acid; the addition of the acid occasioned brisk effervescence. The solution on evaporation yielded 42½ grains of a slightly yellowish matter.

(*l.*) A portion of this was dissolved in water acidulatad with muriatic acid.

(*m.*) To a portion of *l.*, solution of hydrosulphuric acid was added and heated; no change resulted.

(*n.*) The liquid *l.*, gave a white precipitate with sulphuric acid, soluble in a large excess of water; in another portion to which ammonia had been added, oxalic acid occasioned a precipitate, soluble in nitric and muriatic acids, insoluble in oxalic and acetic acids, indicating *lime.*

(*o.*) To the liquid *l.* was added sufficient solution of ammonia to render it neutral, causing also a gelatinous precipitate, the

addition of hydrosulphate of ammonia changed the latter to dark green, the precipitate was separated by filtration, washed, and dissolved in water acidulated with sulphuric acid; with portions of this solution, ammonia and solution of potassa caused white precipitates; ferrocyanide of potassium a blueish white precipitate which soon changed to deeper blue; ferrocyanide of potassium produced a precipitate of a dark-blueish-green color, which was completely destroyed on the addition of potassa. Tincture of galls produced no change. These experiment indicate the presence of a *proto-salt of iron*, notwithstanding the heating and exposure to which in incinerating the root it was subjected. To confirm this opinion, several other experiments corresponding with the above results, were made with the liquid *l.*

(*p.*) The liquid *l.* was boiled with carbonate and muriate of ammonia, to remove lime, and filtered; the addition of phosphate of soda caused a precipitate soluble in acetic acid, indicative of *magnesia.*

(*q.*) Chloride of barium produced a precipitate but partially soluble in nitric and hydrochloric acids, and muriate of ammonia showing the presence of *sulphuric* acid.

Other experiments indicated the presence of *sulphuric* and *phosphoric* acids.

The constituents of the root of Hydrangea arborescens, as the above experiments indicate, are *gum*, *albumen*, *starch*, *resin*, *soda*, *lime*, *potassa*, *magnesia*, *sulphuric* and *phosphoric acids*, and a *proto-salt of iron*. In regard to the active principle of the plant, the writer must regret that he has not isolated it, if indeed, the activity be due to any individual constituent, or to a *combination* existing in the root; the latter seems the most probable, and, it may be that much of its efficacy is due to the large amount of mucilaginous matter which forms an important constituent of this plant. But whatever its virtues may be owing to, it is to be hoped that the real therapeutic merits of the root will be satisfactorily determined by a more extensive, successful application of it in cases of the troublesome disease for which it has been so highly recommended.

ON CERATUM CANTHARIDIS.

To the Editor of the American Journal of Pharmacy.

Dear Sir,—Having for some time been in the habit of using a a peculiar formula for the preparation of the Cerat. Cantharidis, of the U. S. Pharmacopœia, I have thought it advisable to acquaint you with it, in order that it may be given publicity if deserving of it, which I take the liberty to leave to your superior judgment. It has no doubt frequently occurred to many that the cerate prepared according to the present formula, is too hard in consistence to be spread with facility with a spatula in winter, but of course in less degree in summer.

To obviate this defect, I have been in the habit of substituting for a portion of the *resin*, an equal portion of the liniment. cantharidis of the U. S. P. This I have found to render the cerate more homogeneous, and to avoid its objectionable hardness, and although adding slightly to its strength, I have not found this at all objectionable to many of the first physicians of Washington who have used it, but rather desirable, on account of the variation in the strength of the cerate arising from the quality of the flies, and the amount of care and attention bestowed upon its preparation. The formula is as follows:

℞ Carthar. Pulv. ℔i.
Cera. flav.
Adipis *aa* ℥viii.
Resinæ
Linim. Canthar. *aa* ℥iv.
M. S. A.

I add the liniment to the resin, lard and wax at the lowest temperature at which they are liquid, and then add the flies as directed by the Dispensatory. The above are the proportions for warm weather: in cold weather the quantity of liniment may be increased, say to ℥vi. Any modification of this which your superior judgment may dictate will add greatly to its value; but it has not escaped me that it may occur to you, that the simple *addition*

*[The writer is perhaps not aware that in the present formula of Pharm., 1850, the consistence of this cerate has been changed to meet the difficulty noticed by himself in common with others.—Ed.]

of a sufficient quantity of the lin. canth. to render the cerate softer, would be equally as good as the above. I do not think so, having tried both; but if either of these suggestions seem to you worthy of notice, my object will be gained by your making the disposal of it which to you may seem best. Not being now an apothecary, I do not think it necessary to subscribe my name, but will take the liberty of signing myself

Respectfully yours, A. Z.

Georgetown, D. C., Sept. 22d, 1851.

PROCEEDINGS OF THE CONVENTION OF PHARMACEUTISTS AND DRUGGISTS, HELD IN THE CITY OF NEW YORK, OCT. 15, 1851.

In pursuance of a call issued by the College of Pharmacy of the City of New York, a Convention of Delegates from the different Colleges of Pharmacy in the United States assembled at the College Rooms in New York, at 5 o'clock, P. M., on Wednesday, the 15th of October. Delegates from Philadelphia and Boston were in attendance. The Maryland College (at Baltimore) and the Cincinnati College were not represented, although delegates from each had been previously reported to the committee of arrangements in New York. A communication of some length was received from the Cincinnati delegation.

The convention was organized by calling Mr. Charles Ellis, of Philadelphia, to the Chair, and Dr. Samuel R. Philbrick,of Boston, to act as Secretary pro tem. A committee was then appointed by the nomination of each delegation, consisting of Messrs. Samuel M. Colcord of Boston, Alfred B. Taylor of Philadelphia, and George D. Coggeshall of New York, to examine credentials and nominate officers for the convention. The committee retired, and on their return reported the credentials satisfactory, and proposed Dr. C. B. Guthrie* of New York as President, and Mr.

* [To those who are not acquainted with Dr. Guthrie, it may appear singular that the President of a Pharmaceutical Convention should be a physician. To such we will say, that Dr. Guthrie, though a graduate of medicine, and at one time a practitioner, has for many years past been a

Alfred B. Taylor of Philadelphia as Secretary, who were unanimously confirmed.

Dr. Guthrie, on taking the chair, made a few remarks, expressive of his sense of the honor conferred by appointing him presiding officer of the first convention of the kind ever held in the United States, and explanatory of the objects of the convention, which were in accordance with the growing feeling amongst druggists and pharmaceutists of the necessity to establish standards of the qualities of imported drugs and medicines for the government of the United States Inspectors at the different ports, and, in addition, to act upon such matters of general interest to the profession as may be presented to the consideration of the convention.

Two reports were presented by the New York Delegation; one from Messrs. Guthrie and Coggeshall, and the other from Mr. Merrick, embodying their views upon the subject of standards, and also in regard to false drugs which should be excluded. Some difference of opinion existed in reference to the admission of certain kinds and qualities of drugs, which, although in demand, were deemed by the majority as not contributing to the benefit of medicine, and as perhaps affording inducements to the designing.

A communication from the Cincinnati delegates was read, after which Mr. Restieaux, of Boston, read an interesting statement of the working of the drug law in that city. A letter from Dr. David Stewart, Inspector of drugs at Baltimore, and a member of the Baltimore delegation, who was unable to be present, was also read, expressing his views in regard to the subject.

A general discussion ensued upon various topics connected with the business of the convention, and resulted in the appointment of a committee, consisting of Messrs. Procter of Philadelphia, Restieaux of Boston, and Coggeshall of New York, to consider the several communications, and arrange the general plan of business, and report at the next sitting.

The convention then adjourned to Thursday at 12 o'clock.

Second Sitting, Oct. 16th.—The convention met at 12 o'clock.

druggist. The deep interest taken by Dr. G. in the working of the law for the inspection of imported drugs, and his position in the New York delegation very naturally suggested his name as chief officer of a convention specially called in reference to that Act.—EDITOR.]

The committee appointed yesterday made a report in reference to the special object of the convention, followed by a preamble and resolutions in reference to a general organization of Pharmaceutists throughout the United States, which was read.

The report was considered in sections with full, deliberate, and very interesting discussion, in which the members generally participated, and after some amendments, the following portions of the document which embrace the views and recommendations of the convention were adopted.

"1. We consider that the Law is already ample in its general provisions in guarding the admission of drugs, medicinal substances and preparations, under the reference which it distinctly requires to the Pharmacopœias and Dispensatories specified in it; we think it right to designate a few prominent articles for which positive standards are required.

"2. All drugs and chemicals employed in manufacturing *chemical preparations* used in medicine, may be admitted of less than standard purity, upon sufficient bonds being given that such articles are solely to be devoted to said uses.

"3 Opium should not contain less than *eight* per cent of pure morphia, unless intended for manufacturing [into morphia, codeia and other chemical principles. Ed.] as above stated.

"4. Two varieties of scammony should be admitted, 'Aleppo cake scammony,' that contains not less than 40 per cent. of *true scammony resin;* and the so-called Virgin scammony that contains not less than 65 per cent. of the same resinous principle.

"5. All elaterium not containing 25 per cent. of *elaterin* should be rejected.

"6. Iodine, unless intended expressly for manufacturing, should not contain more than 3 per cent. of water, and should be free from all other impurities.

"7. Gum resins used solely in medicine, as assafœtida, ammoniac, &c., should be rejected when they contain more than 15 per cent. of extraneous matter, whether accidental or designed.

"8. Barks derived from the Cinchonas growing in the northern Provinces of South America, and which contain *cinchonia* with or without *quinia*, should be admitted; all other barks falsely sold as cinchona bark, should be rejected. [This section is intended to apply to the false barks derived from the region mentioned,

Brazil, and the West Indies, which contain none of the cinchona alkaloids, and not to the Peruvian barks properly so called. Ed.]

"9. As there is no good reason for the introduction of European rhubarb into this country, owing to its inferior strength, we recommend that all rhubarb of European origin be excluded. [This section was introduced with a view to guard against the importation of cheap European rhubarb for the purpose of adulterating the Asiatic varieties, it having been used for that purpose. Ed.]

"10. The uninjured portion of partially damaged drugs, &c., may be admitted, provided the importer will, under the superintendence of the Inspector, cause all the damaged portions to be removed:—and drugs otherwise good, if loosely admixed with extraneous substances to an extent that in the proper construction of the law would cause them to be rejected, may be passed, if the importer will remove all such extraneous parts under the direction of the Examiner.

"11. It is recommended that the Examiner of each port be required to collect and deposit in his office a cabinet of specimens of drugs, chemicals, and permanent medicinal preparations, as complete as practicable, to be used for comparison in the course of inspection.

"12. And finally this Convention respectfully and earnestly recommends, as the useful working of the law, after all, depends mainly on the integrity and ability of the Examiners, that the greatest carefulness should be exercised by the appointing power in the selection of these officers; in furtherance of which the Colleges of Pharmacy would cheerfully render their assistance if solicited."

The Convention having disposed of that portion of the report which related to the object for which it was more especially called; the Preamble and Resolutions brought forward by the Committee were considered and adopted, viz:

"*Whereas*, The advancement of the true interests of the great body of pharmaceutical practitioners in all sections of our country is a subject worthy of earnest consideration; and *whereas*, pharmaceutists, in their intercourse among themselves, with physicians and the public, should be governed by a code of ethics calculated to elevate the standard and improve the practice of their art;

and *whereas*, the means of a regular pharmaceutical education should be offered to the rising pharmaceutists by the establishment of Schools of Pharmacy in suitable locations; and *whereas*, it is greatly to be desired that the united action of the profession should be directed to the accomplishment of these objects; therefore,

"*Resolved*, That in the opinion of this convention much good will result from a more extended intercourse between the pharmaceutists of the several sections of the Union, by which their customs and practice may be assimilated; that pharmaceutists would promote their individual interests, and advance their professional standing, by forming associations for mutual protection, and the education of their assistants when such associations have become sufficiently matured; and that, in view of these important ends, it is further

"*Resolved*, That a convention be called, consisting of three delegates each, from incorporated and unincorporated pharmaceutical societies, to meet at Philadelphia on the first Wednesday in October, 1852, when all the important questions bearing on the profession may be considered, and measures adopted for the organization of a National Association, to meet every year."

In accordance with these resolutions, it was resolved that the President of the Convention be requested to transmit an invitation to the authorized bodies at least three months previous to the time of meeting, desiring such bodies to acquaint him with the names of the delegates they may appoint.

On motion, it was resolved, that the New York delegation be appointed a committee to lay the report and proceedings of this convention before the Secretary of the Treasury of the United States, and afterwards to have them published in pamphlet form.

Dr. Philbrick, of Boston, offered the following preamble and resolution, which were adopted:

Whereas, To secure the full benefits of the prohibition of sophisticated drugs and chemicals from abroad, it is necessary to *prevent home adulteration*, therefore,

Resolved, That this convention recommend to the several Colleges to adopt such measures as in their respective States may be best calculated to secure that object.

On motion of Mr. Colcord, of Boston, it was

Resolved, That a committee of three be appointed by this convention, to act as a standing committee, to collect and receive such information as may be valuable, and memorials and suggestions from medical and pharmaceutical associations, to be presented to the next convention.

The President appointed G. D. Coggeshall of New York, S. M. Colcord of Boston, and W. Procter, Jr. of Philadelphia, as the committee.

A vote of thanks to the officers was passed, and then the convention adjourned, to meet in Philadelphia on the first Wednesday in October, 1852.

REPORT OF A JOINT COMMITTEE OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY AND THE PHILADELPHIA COLLEGE OF PHARMACY, RELATIVE TO PHYSICIANS' PRESCRIPTIONS.

(*Published by order of the Board of Trustees of the Philada. Coll. of Pharm.*)

The joint Committees of the Philadelphia County Medical Society, and of the Philadelphia College of Pharmacy, appointed for the purpose of considering the means best adapted to prevent the occurrence of mistakes in the compounding of the prescriptions of Physicians by Apothecaries, beg leave to report that they have given to the subject all the attention that its importance demands, and present the following hints as the results of their joint deliberations. They have taken the liberty of adding, also, a few general hints on the relations that should exist between physicians and pharmaceutists.

A. *In Respect to Physicians.*

1. Physicians should write their prescriptions carefully and legibly, making use of good paper, and, whenever possible, of pen an l ink. When obliged to write with a pencil, they should take the precaution to fold the prescription twice, so as to prevent its being defaced.

2. The nomenclature of the United States Pharmacopœia is becoming annually more in favor with pharmaceutists; a statement attested by the fact that 1500 copies of the book of Latin Labels for shop furniture, published by the Philadelphia College of Pharmacy, have been disposed of within three years. Physicians are

also becoming more alive to the merits of our national Codex, and they are respectfully urged to familiarize themselves with its nomenclature, and to adhere to it strictly in their prescriptions.

3. The numerous treatises on Materia Medica, Pharmacy and the Practice of Medicine, of English origin, that are reprinted in this country, notwithstanding, they are generally interlarded with the formulæ of our own Pharmacopœia, tend, nevertheless, very much to confuse the physician and apothecary, in the use and exact meaning of terms in prescriptions. To obviate the difficulties thus occasioned, the physician should, when he prescribes a medicine, which is not officinal, nor in common use, state on his prescription, either in a note at the bottom, or within parenthesis, following the article, the authority or work from whence it is derived, as "Griffith's formulary"—"Ellis' Formulary"—"Braithwait's Retrospect," etc.

4. Physicians would lessen the risk of errors in their prescriptions, and increase the chances of their detection should they be made, by observing the following hints.

1st. Write the name of the patient at the top of the prescription, unless a good reason prevents this being done; in which case, it should be expressed as for Mr. G—, Mrs. R.—, or Mrs. S.'s child, or for Master T—, so as to convey to the apothecary some idea of the age of the patient.

2d. The date and name of the physician or his initials, should always be appended, and, whenever practical, the dose and mode of administering the medicine directed.

3d. When an unusually large dose of an active medicine is prescribed, as opium, morphia, elaterium, strychnia, etc., let such names be put in *italics*, and the quantity or quantities repeated in writing enclosed within a parenthesis; thus:—℞ Morphiæ Sulphatis grs. vj. (six grains.) Div. in chart. vj.

4th. When an active substance is to be used externally, it should be so stated on the prescription; thus, "For external application"—"To be applied to the part as directed," etc.

5th. The quantities of each article should be placed in a line with the name, and not below it and in using the Roman numerals, the *i*'s should be dotted correctly.

6th. The occasional practice of writing the directions intended for the patient in *latin*, and especially in abbreviated latin, is un-

called for, and attended with some risk; it is far safer to write them in English, and without abbreviation or the use of figures, unless these are well and distinctly formed.

B. *In Respect to the Apothecary.*

1st. The apothecary should hesitate to dispense a prescription, the handwriting of which is so imperfect as to render the writer's meaning doubtful—especially if it involves agents of a poisonous or irritating character—unless he is able, from collateral circumstances, to satisfy himself of the intent of the prescriber. In such a case he should delay the delivery of the medicine to the patient until he can see the physician, and in doing so he should avoid committing the latter by agreeing to send the medicine when it is ready.

2d. The apothecary is justified in the same means of delay, if he, after deliberate consideration, believes that the physician has inadvertently made a mistake in the quantity or dose of the article or articles prescribed; always keeping in view the physician's reputation as well as his own. Every respectful application, in such cases, to a physician, should he met in good faith and with kind feeling, even though no error should prove to exist.

3d. In his demeanor and language, the apothecary should cautiously avoid compromising the physician, unless it be unavoidable, in which case honesty is the best policy, and the patient or his messenger should be told that it will be necessary to have an interview with the physician previously to compounding his prescription.

4th. The apothecary is not justifiable in making inquiries relative to the patient or his disease, or remarks relative to the character or properties of the medicines prescribed, that are uncalled for, or likely to convey a wrong impression, through an ignorant messenger, to the patient, excepting it be done in a case where he has doubts in regard to the prescription, and wishes to satisfy himself, and here he should act with great discreetness.

5th. When an apothecary is asked his opinion of a physician's prescription in a manner that indicates want of faith in the prescriber, he should waive the question, unless by a direct answer he should be able to restore that confidence. When asked the nature of the ingredients he should be guided in his answer by circumstances, avoiding to give the desired information, when he believes

it would be contrary to the wish of the physician, or attended with injurious consequences. In other cases he should use his own judgment.

6th. Physicians being often unacquainted with practical pharmacy, pay little attention to the order in which the several articles entering into a prescription are arranged, with the view to facilitate the operations of dispensing. It hence becomes the first duty of the apothecary carefully to read the prescription and fix the proper order in his mind. He should, at the same time, acquire the habit of considering the quantities ordered in relation to the usual doses, and, also, the general bearing of the prescription; and a constant resort to to this practice, based on due knowledge, must almost inevitably detect mistakes, if any have been made.

7th. Apothecaries should accustom their assistants to study prescriptions in this light, and to acquire such a knowledge of the doses and therapeutical uses of medicines as shall serve to guide them in avoiding errors.

8th. The apothecary, when engaged in dispensing a prescription, should, as far as possible, avoid mental preoccupation, and give his attention fully to his task. He should acquire the habit of *always* examining the label of the bottle before using its contents, and he should satisfy himself that he has read the prescribed quantity correctly, by referring to the prescription anew before weighing out each article. It is also, a useful precaution to have bottles containing mineral or vegetable poisons, distinguished by some prominent mark.

9th. As the conscientious discharge of his duty should be the aim of every apothecary, seeing that on his correct action depends, in no slight degree, the usefulness of the physician, no pains should be spared to secure the efficiency of the medicines dispensed, whether they be drugs or preparations. The latter should always be prepared of full strength, and according to the formulæ recognized by the United States Pharmacopœia, unless when otherwise specially ordered.

10th. The apothecary should always label, and number correctly, all medicine dispensed by him on the prescription of a physician; he should, also, invariably, transcribe on the label, in a plain legible hand-writing, the name of the patient, the date of the prescription, the directions intended for the patient, and the name or the initials of the prescriber.

11th. The original prescription should always be retained by the apothecary, whose warrantee it is, in case of error on the part of the prescriber. When a copy is requested, if, as in many instances, no objection can be urged, it should be a *fac-simile* in language and symbols, and not a translation.

12th. In no instance is an apothecary justifiable in leaving his business in charge of boys, or incompetent assistants—or in allowing such to compound prescriptions, excepting under his immediate and careful supervision.

13th. In justice to his sense of the proper limits of his vocation, to the medical profession, and to his customers, the apothecary should abstain from prescribing for diseases, excepting in those emergencies, which occasionally occur, demanding immediate action, or, in those every day unimportant cases, where to refuse council would be construed as a confession of ignorance, calculated to injure the reputation of the apothecary, and would be attended with no advantage to either physician or patient.

14th. The sale of quack or secret medicines, properly so-called, constitutes a considerable item in the business of some apothecaries. Many of the people are favorably impressed towards that class of medicines, and naturally go to their apothecaries for them. It is this which has caused many apothecaries to keep certain of these nostrums, who are ready and willing to relinquish the traffic in them, but for the offence that a refusal to supply them to their customers, would create. At present all that the best disposed apothecary can be expected to do, is to refrain from the manufacture himself, of quack and secret medicines; to abstain from recommending them, either verbally or by exhibiting show-bills, announcing them for sale, in his shop or windows; and to discourage their use, when appealed to.

15th. Having in view the welfare of the community and the advancement of pharmaceutic science and interest, it is all important that the offices of prescribing and compounding medicines should be kept distinct, in this city and surrounding districts. All connection with, or moneyed interest in apothecary stores on the part of physicians, should, therefore, be discountenanced. With respect to the pecuniary understanding said to exist in some instances, between apothecaries and physicians, we hold, that no well disposed apothecary or physician would be a party to such a contract, and consider the code of Ethics of the College of Phar-

macy and the Constitution of the Philadelphia County Medical Society as sufficiently explicit on this subject.

16th. In reference to the patronage on the part of Physicians of particular apothecaries, we are of the opinion, as a general rule, that Graduates in Pharmacy should be encouraged in preference to others of the same date of business, and whilst admitting the abstract right of the physician to send his prescription where he pleases, we think that justice should dictate the propriety of his encouraging the nearest apothecary deserving of his confidence and that of the patient.

D. FRANCIS CONDIE, WM. MAYBURY, G. EMERSON.	*Committee of County Medical Society.*
WILLIAM PROCTER, JR., H. C. BLAIR, JOHN H. ECKY,	*Committee of Phila. College of Pharmacy.*

EXAMINATION OF A CONSTITUENT OF CAPSICUM.

By JOHN T. PLUMMER, M. D., of Richmond, Ind.

Tincture of capsicum, made by displacement, in the course of a few days after the filtration, yielded a bulky, but very light, white flocculous, distinctly separated from the liquid but remaining suspended in it. Filtered out it was found:—

1. Unctuous or soapy to the touch.
2. White.
3. Easily saponifiable with potash, forming a pearly looking compound.
4. Neither acetic nor the mineral acids acted on it.
5. Insoluble in water.
6. Insoluble in cold alcohol; yet the displacement was effected by alcohol at the temperature of the season.
7. Tasteless.
8. Soluble in essential oils.
9. Very sparingly soluble in boiling alcohol, separating, on cooling, in balls or conglomerations of hollow, delicately thin, transparent, microscopic spherules.
10. At 100° (Fah.) it leaves a greasy looking spot on paper; at a higher temperature, to soften and render the paper transparent.

11. Not to soften in boiling water.

12. To soften like dry glue or some resins, but not to fuse, when heated on glass short of the temperature of 200°, and to be converted into a brittle, resin-like, light brown substance, giving off a light blue smoke, having an evident odor of wax.

13. About, or perhaps considerably above the temperature of 200°, the brittle brown substance of 12 became blackish, and the substance finally evaporated, leaving a white, brittle, insipid ash, which was insoluble in water.

PHARMACEUTICAL NOTICES.

By A. B. Taylor.

Syrup of the Iodide of Zinc.

Iodide of Zinc has been used both internally and externally, though we believe less frequently in the former than in the latter method. It is tonic and astringent in its action, combining to some extent the properties of Iodine and of the Zinc preparations; though, like the Iodides of Lead, Iron, Silver and Mercury, apparently exhibiting chiefly the medicinal action of its metallic constituent. Perhaps the best general form for administration is that of a syrup, as it is otherwise (like the Iodide of Iron) exceedingly liable to decomposition. Dr. A. S. Thompson, of London, several years ago suggested such a preparation; but we have not seen any published formula for it. Having had occasion to prepare it, we have used the following:

℞.	Iodine - - - -	ʒxii—℈ij.
	Zinc - - - -	℥j.*
	Sugar - - - -	lb.i. (*avoir.*)
	Water - - - -	f℥ix. or sufficient

to make one pint of Syrup.

The Zinc having been *finely granulated*, is added (together with the Iodine) to the water, in an evaporating dish, and gently heated, until the Iodine is completely taken up by the Zinc,—which is

*The combining proportions of the two elements in the salt are about 4 parts of Iodine to 1 part of Zinc; but it is advisable to have a considerable excess of zinc in preparing the iodide.

known by the solution becoming colorless. This solution is immediately filtered, while yet hot, on to the sugar (previously put into a convenient wide-mouthed bottle, upon the side of which a pint measure has been marked,) and sufficient water added to the filter to make a pint of the syrup. If the sugar does not dissolve readily, a gentle heat may be applied. The Syrup thus obtained contains one drachm of the Iodide of Zinc in each fluid ounce. It is perfectly clear and colorless in appearance, and has a strong styptic and peculiar metallic taste.

Castillon's Powders.

An excellent diet for invalids, in cases of indigestion, chronic dysentery, &c., known as "Castillon's Powders," has been considerably employed by the medical profession. Although a somewhat popular article, we are not aware that the formula has been given to the public in any of our journals, and accordingly present it here:

℞.	Pulv. Sago.	. - -	ʒiv.
	" Salep.	- - -	ʒiv.
	" Tragacanth.	- -	℥iv.
	" Testæ Præp.	- -	℥i.

The ingredients to be well mixed, and to be divided into twelve powders.

A small quantity of cochineal has generally been added to the mixture for the purpose of coloring it; but it is conceived to be preferable without it.

For use, each powder is to be boiled with a pint of milk; which may be sweetened and flavored to suit the taste.

Dr. Jackson's Pectoral Syrup.

A prescription of Prof. Samuel Jackson of Philadelphia, familiarly known as his "Pectoral Syrup," has obtained a considerable reputation from its beneficial action in cases of cough, colds, &c. We believe the prescription was originally given to Mr. E. Durand, but as the Syrup has for some time been a standing preparation with many of our druggists, we have thought that a published formula would be acceptable, both for the purpose of giving its benefit to those who may not be familiar with its composition, and

of promoting uniformity among those who may already be accustomed to prepare it. Dr. Jackson has furnished us with the following recipe:

℞.	Sassaf. Medullæ - - -	ʒi.
	Acaciæ - - - - -	℥i.
	Sacchari - - - -	lb.i $\frac{3}{4}$.
	Morphiæ Muriat. - - -	gr. viii.
	Aquæ - - - - -	O i. or *q. s.*

The Sassafras Pith and Gum Arabic are to be put into the water, and allowed to stand ten or twelve hours, with occasional stirring. The sugar is to be dissolved (cold) in the mucilage thus obtained, which after being strained, should be made to measure two pints by the addition of water. Lastly, the Muriate of Morphia is to be dissolved in the Syrup.

A small quantity of Hoffman's Anodyne was formerly added to prevent fermentation: but this has been omitted as being unnecessary when the syrup is carefully prepared.

This syrup contains one-fourth of a grain of Muriate of Morphia (we believe originally $\frac{1}{2}$ gr.) in each fluid ounce; and is given in doses of a teaspoonful every two or three hours, according to circumstances.

Dr. Jackson's Pectoral, and Ammonia Lozenges,

Are two other preparations of the same physician, and designed for a similar purpose with the above. They have both become somewhat popular remedies, and merit publication. The following is the formula for the "Pectoral Lozenges:"

℞.	Pulv. Ipecac. - - - -	gr. x.
	Antimon. Sulph. Præcip. - -	gr. v.
	Morphiæ Muriat. - - -	gr. vi.
	Pulv. Acaciæ	
	" Sacchari	
	" Ext. Glycyr.	*aa* ʒxi.
	Tinct. Tolut. - - - -	ʒiv.
	Ol. Sassaf. - - - -	gtt. iv.

The above to be made into a stiff mass with simple syrup, and divided into 200 lozenges, or into lozenges of ten grains each.

The formula given by Dr. Jackson for the "Ammonia Lozenges," is as follows:

℞.	Ammoniæ Muriat.	- - -	℥ifs.
	Morphiæ Muriat.	- - -	gr. iii.
	Pulv. Ulmi	- - - -	℥vi.
	" Acaciæ		
	" Sacchari		
	" Ext. Glycyr.	*aa*	℥vii.
	Tinct. Tolut.	- - - -	℥iii.
	Ol. Gaultheriæ	- - - -	gtt. iv.

To be made with syrup as above, and divided into 180 lozenges, or into lozenges of 10 grains each.

OXALIC ACID GENERATED BY THE ACTION OF NITRIC ACID ON OIL OF AMBER.

By John T. Plummer, M. D., of Richmond, Ind.

About the middle of the present year, (1851) I subjected a small quantity of oil of amber to the action of nitric acid, for the purpose of making artificial musk. After the materials had undergone the usual change, I set them aside; and various avocations afterward claiming my attention, I did not separate the acid from the plastic mass until three or four months had elapsed. After pouring off the acid, and adding warm water to the mass, I thought I heard an obscure crepitation in the vessel, like that occasioned by the solution of oxalic acid. Thinking it possible that, as is the case with various animal and vegetable substances, oxalic acid might have been generated by the reaction of the mineral acid on the *oleum succini*, I examined carefully the waxy mass, and found small groups of elongated, but not quite acicular crystals, and during the process the crepitation alluded to became very apparent.

To the solution of these crystals I applied the usual tests of oxalic acid, chloride of calcium, and chloride of barium, and sulphate of lime; all of these reagents produced a white precipitate: the two first acting immediately, and yielding a copious deposit; the last was much more tardy in its action. The precipitates were easily soluble in nitric and in hydrochloric acids.

ON CASSIA FISTULA.

By Dr. X. Landerer,

Hon. Member of the Pharmaceutical Society of Great Britain, Professor in the University of Athens, Pharmacien to the King of Greece, &c.

Pharmacologists distingish the following varieties of the drug called Cassia Fistula, namely :

1. *Cassia Levantica.*
2. *Cassia Ægyptiaca.*
3. *Cassia Occidentalis.*
4. *Cassia fistula Brasiliensis seu Marylandica.* [?]

Respecting the second of these, Egyptian Cassia Fistula, I have received some particulars not wholly without interest, which I will venture briefly to detail.

Among laxative and resolvent medicines none is more frequently employed in the East, than Cassia Fistula administered in the form of decoction, or as an electuary mixed with a sweet or acidulous beverage, as Bosá or Scherbet.

The use of Cassia has of late much diminished, and the culture of the trees in Egypt is becoming somewhat neglected. At the present day the *Cassia fistula*, Lin., grows in the neighborhood of Aphti, a village near the towns of Damation and Feraskuri, which are about two days' journey from Alexandria. The trees, which are here sufficiently numerous to form a little forest, are from forty to fifty feet in height, and frequently exceed two feet in circumference; their age is estimated by the villagers at from two to three centuries. In January and February the trees flower; the large yellow very odorous blossoms are employed by the inhabitants of the country as a perfume for the clothes. The collection of the fruit commences in June and lasts till August. Loaded with thousands of long pendulous fruit reaching to the earth, the Cassia trees at this period present a most interesting appearance, reminding one by their pendant branches of the weeping-willow. Under their shade the Arab protects himself from the burning heat of the sun, and there also seeks shelter at night.

The quantity of Cassia Fistula carried to the bazaars of Alexandria and Cairo amounts to 500 quintals [50,000 pounds weight per annum], the half of which is consumed in Egypt, the remainder being exported to Constantinople, Marseilles, Triest and Odessa.

The Egyptians imagine the immature fruit far superior to that collected when perfectly ripe, and by the dealers the smaller pods are preferred.

[There is some ambiguity in the author's enumeration of the varieties of Cassia pods, which are the produce of two distinct species, namely :—

1. *Cassia fistula* Lin., *Cathartocarpus fistula*, Persoon. The pods of this species may be distinguished according to their place of growth, as *Cassia fistula orientalis* and *Cassia fistula occidentalis*.—See Hill's *History of the Materia Medica*, London, 1751. By some writers, as Pomet, two varieties of *Cassia fistula orientalis* are noticed, namely, *Cassia fistula* of the Levant, and *Cassia fistula* of Egypt.

2. *Cassia Brasiliana*, Lam. This produces the horse cassia of Jamaica. It is not used in Europe.

The dried leaves of *Cassia Marylandica*, Linn., a plant of the United States, are there employed as senna, but we are not aware that the pods of this plant are used in medicine.]—*Lon. Pharm, Jour.* November 1, 1851.

ESSENCE OF JARGONELLE PEAR.

BY THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

The liquid sold under this name, and which has been for some time in use by confectioners, is the *acetate of the oxide of amyle.*

It is prepared with great facility by submitting to distillation a mixture of one part of amylic alcohol (better known by the name of oil of grain,) two parts of acetate of potash, and one part of oil of vitriol. The distilled liquid is to be washed with alkaline water, dehydrated by chloride of calcium, and afterwards rectified by distillation from protoxide of lead.

Its properties are thus stated by Dumas :—In the state of purity it is a colorless, very limpid, volatile liquor, which boils at 257° F. It possesses an ethereal aromatic odor, somewhat resembling acetic ether ; its sp. gr. is less than that of water. It is insoluble in water, but soluble in alcohol, ether, oil of grain, &c. Concentrated sul-

phuric acid does not color it in the cold; but by heating the mixture it becomes reddish-yellow, and when the temperature is elevated, destructive reaction takes place, the mixture blackens and evolves sulphurous acid. Placed in contact with a watery solution of potash it is very slowly altered; but an alcoholic solution of this base rapidly decomposes, an alkaline acetate is formed, and the oil of grain regenerated.

Its ultimate composition is

14 equivalents of carbon,	. . . .	84
14 " " hydrogen,	. . . .	14
4 " " oxygen,	. . . .	32
		130

But its proximate composition is amyle, (an hypothetical radical*) oxygen, and acetic acid.

1 equivalent amyle (C_{10} H_{11})	. . .	71
1 " oxygen,	. . . . . .	8
1 " acetic acid, (C_4 H_3 O_3)	. .	51
		130

Its formula is thus stated by Brande, AylO, AcO_3; by Fownes AylO, C_4 H_3 O_3.

Amylic alcohol, or *oil of grain*, called by the Germans *fuselol*, is the hydrated oxide of amyle, AylO, HO. It is largely produced in the distillation of spirit from corn. It is officinal in the Dublin Pharmacopœia, where it is termed "*Alcohol amylicum—Fusel oil*," and is employed to yield valerianic acid in the process for making "Sodæ Valerianas."

From information which we have received, we have reason to believe that the use, by very young children, of articles of confectionary, flavored with essence of pear, is not without danger. A child on two occasions became partially comatose, with livid lips and feeble pulse, after eating some confectionary which it was calculated contained about one drop of the essence.—*Ibid.*

* This radical has been isolated by Frankland, by decomposing iodide of amyle with an amalgam of zinc. (*Fownes' Chem. 3d edition*, 1850, *page* 379.—ED. AM. JOURN. PHARM.

ON THE SOURCES OF AMYGDALINE.

By Wilh. Wicke.

Amygdaline appears to be more general and of a greater botanico-physiological importance than has hitherto been supposed; and the following experiments show, that it is almost a general constituent of the Pomaceæ. Its presence has been proved by submitting parts of the various plants with water to distillation, and testing the distillate with a salt of iron for prussic acid, under the conviction that no other vegetable matter but amygdaline possesses the property of generating, under these circumstances, prussic acid. The experiments were performed in the month of May, in the laboratory at Göttingen.

I. POMACEÆ.

Pyrus Malus.—The distillate of the green leaves of the bark and of the flower-buds contained no prussic acid.

Sorbus Aucuparia.—The young shoots and the unfolded leaves yielded a strong hydrocyanic distillate; as did also the leaf-pinnæ, the petioles, and especially the bark. On the other hand, the distillate of the flower buds, which had been broken off short from the penduncles, showed no hydrocyanic reaction.

Sorbus hybrida.—Hydrocyanic acid is contained in the bark, and still more abundantly in the young shoots of this tree, which grows wild in the south of Sweden, and occurs singly in Thuringia. The reaction was not so strong in the distillate of the leaflets and of the petioles, whilst that of the developed flowers became at first bluish, and only after a few days flocculi of Prussian blue were deposited.

Sorbus torminalis.—The distillate of the already far advanced shoots, divested of the leaves, smelt strong of prussic acid, and yielded immediately a proportionately abundant precipitate of Prussian blue. A large quantity of leaves yielded a distillate, which became only bluish on being tested. The distillate of the flowers smelt of prussic acid, and corresponded nearly with that of the shoots. The distillate of the bark and flower-stalks resembles that of the leaves.

Amalanchier vulgaris.—The bark, taken from the preceding year's branches, contained a very large proportion of prussic acid.

The leaves also yielded a hydrocyanic distillate; and although the proportion of prussic acid was but inconsiderable when compared with the quantity of leaves employed, still it was larger than in Pyrus torminalis. The distillates of the young fruits, stalks, and young shoots immediately showed the presence of prussic acid.

Cotoneaster vulgaris.—The distillate of the short shoots showed but a very slight hydrocyanic reaction, and the precipitate of Prussian blue separated only after a few days; in that of the bark, of the flowers deprived of their stalks and of the leaves, no hydrocyanic reaction took place.

Cratægus Oxycantha.—Only at the commencement of their vegetation, the distillate of the shoots, about one inch in length, yielded immediately a precipitate of Prussian blue; still the proportion of prussic acid was very insignificant, and at a more advanced stage of vegetation, in no part of the plant could prussic acid be detected.

II. AMYGDALEÆ.

Prunus domestica.—Similar to Cratægus. The very young shoots yielded prussic acid, but neither the developed leaves nor the bark. The more advanced shoots showed in the distillate traces only of prussic acid.

Prunus Cerasus.—The bark of the root and of the branches, the leaves and the young shoots, contained no prussic acid. Nor could any be detected in the distillate of the ovary.

Prunus Mahaleb.—No prussic acid could be discovered in the leaves, in the bark, in the very young and slightly developed shoots and in the flower-racemes, although all these parts were repeatedly examined.

Prunus Padus.—This tree, as is well known, contains amygdaline in all its parts. By distilling the leaves, considerable drops of bitter almond-oil were obtained, and on testing the distillate for prussic acid, an abundant precipitate of Prussian blue was obtained.

These experiments show that amygdaline is very general among the Pomaceæ, and that in many it is continually generated during the process of their development. With the various sorts of Prunus this appears to be otherwise. In the very young organs of

the cherry and plum-trees no amygdaline could be traced, whilst in the kernels of the fruit of these trees it is contained in considerable quantities. There appears to exist here a similar relation to that which is found in Cratægus and Cotoneaster, where, when the young shoots begin to be developed, prussic acid is found in the distillate, whilst the other organs and the shoots at a more advanced period yield no hydrocyanic distillate.

That amygdaline has an active share in assisting the process of development appears also to be indicated by the fact that it is found in the largest proportion in the young shoots even of those plants, which contain it in all their organs, such as *Sorbus torminalis* and *Amalanchier vulgaris.—London Phar. Journal, October* 1, 1851, *from Annalen d. Chemie und Pharmacie.*

ON THE TESTS FOR DETERMINING THE VALUE OF CINCHONA BARKS.

By Dr. A. Buchner.

The author draws the attention of druggists to the importance of ascertaining the amount of alkaloids in the barks, and the preference which this method deserves, to all others which are founded upon external characters. He calls attention to the method of examination proposed by Wöhler, and finds it to answer its purpose completely when the requisite time can be given to it. The author has made numerous experiments with a view to discover a process which shall require far less time. This process, the value of which was tested upon several Cinchona barks, gave the following results:

Cortex Cinchonæ Regius [Calisaya.]—3 oz. of this bark, which exhibited all the characters of being genuine, were exhausted with 8 oz. water to which 1 scruple of officinal dilute sulphuric acid had been added, the mixture kept for 24 hours at a temperature of 122° to 140°F., frequently agitated, and then brought upon a filter. The filtered liquid was perfectly clear, of a very pale yellow color, and possessed an agreeable aromatic odor and an acid bitter taste. The residual powder was digested twice more from twenty

to twenty-four hours at the same temperature with 8 to 9 oz. of water and a few drops of dilute sulphuric acid until the last filtrate was rendered but faintly turbid by ammonia. The whole of the extracts were united, and the alkaloid precipitated until a filtered sample was no longer rendered turbid by ammonia. The precipitated quinine was collected upon a filter, washed, pressed, and dried. In the moist state it had a chocolate-brown color; when dry, it was dark reddish brown, and weighed 21 grs. There were therefore 2·187 per cent. of colored quinine; the time requisite for this process may be further shortened by boiling, instead of digesting at the abovementioned temperature. 1 oz. of the powdered bark was boiled half an hour with 12 oz. of water and ½ a scruple of dilute sulphuric acid, and the residual powder washed out with about 4 oz. more hot water, and the filtered solution immediately precipitated with ammonia or carbonate of soda. The precipitate is washed with cold water, and dried between blotting paper.

The author purified this colored quinine. This operation, however, was accompanied by so great a loss, that, calculating the quantity in the bark from the quantity of pure quinine obtained, it would amount only to ½ per cent. For the purpose of testing a bark as to its genuineness, it suffices merely to prepare the colored quinine, and this method is then both quick and simple.

This method was applicable to the examination of the barks of *Cinchona fusca*, *C. Huamalies*, *C. flava*, and *C. Surinamensis*. *C. Brasiliensis*. The test is easily applied and decisive when the question to decide is whether the powder has been prepared from *C. regia*, *C. fusca*, or *C. flava*, or from any false Cinchona barks. Yellow bark, exhausted with hot water to which a little sulphuric acid has been added, furnishes a pale yellow infusion of a peculiar aromatic odor, which, on being mixed with an excess of ammonia, gives a copious reddish-brown precipitate, and the liquid at the same time assumes a beautiful red color; red bark, on the other hand, furnishes a brownish-yellow or ochreous precipitate, and the infusion is colored yellowish-brown by the ammonia. The pale Carthagena bark likewise yields with water acidulated with sulphuric acid a pale sherry-colored infusion, which also gives a chocolate-brown precipitate with ammonia, like the infusion of yellow bark; but the filtered ammoniacal liquid is not red, but

of a darker yellow. Huamalies bark, exhausted in the same manner, furnishes a dark yellow infusion of a less aromatic odor than the yellow bark, and with ammonia an ochreous precipitate like the brown Huanuko bark; but the filtered ammonical liquid is not yellowish-brown, but red, almost like the infusion of *C. regia.* The false barks furnish with pure water and with water to which a little sulphuric acid has been added, much darker-colored infusions than the genuine barks; they possess a more astringent taste, and furnish no alkaloid when mixed with ammonia until they have an alkaline reaction.

If it be desired to ascertain the amount of alkaloid more accurately than is possible according to the above method, the acid ex tracts must be concentrated as much as possible by evaporation; moreover, the alkaline liquids filtered from the precipitated alkaloids should be evaporated to dryness in order to remove from them the remainder of the quinine or cinchotine.

The alkaloids precipitated from the acid infusions of the barks by ammonia or carbonate of soda are, in every case, combinations of them with a humus-like cinchona coloring substance, which in the *C. regia* is a different one from that contained in the brown kinds of bark, and is present in variable quantity. This coloring matter may be very easily separated from the alkaloid by acetate of lead.

It may be assumed that 1 oz. of yellow bark, exhausted with 12 oz. of water and from ½ to 1 scruple of dilute sulphuric acid, will furnish, on precipitation by ammonia, not less than 10 grs. or 2 per cent. of the weight of the bark of colored quinine.

The brown or Huanuko bark gives, on being treated in the same manner, only from 8 to 9 grs. of colored alkaloid, and frequently less. Besides cinchonine, it contains another alkaloid, which is soluble both in ether and in water containing soda, and which is not quinine, but most probably cinchotine.

1 oz. of the Huamalies, or rusty bark, furnished 7·5 grs., or 1·54 per cent. of colored alkaloid; it is therefore one of the richer kinds, and most probably more active. However, no quinine could be detected in it; for the portion which was pretty soluble in water and ether, on being dissolved in chlorine-water, was not rendered green by ammonia; it may therefore be assumed as highly probable, that the Huamalies, like the Huanuko bark, contains cinchotine besides cinchonine.

Of the pale bark, *Cinchona flava*, [Carthagena] 1 oz. furnished 6·35 grs. of colored alkaloid, or 1·32 per cent.; but it differs very remarkably from the *C. regia*, not only by its external characters, but also from its containing no quinine ; the alkaloid in this kind appears to consists for the greater part of cinchotine. From the large amount of alkaloid contained in it, it is probable that the *C. flava*, though not to be compared with *C. regia*, should be counted among the most active of the barks.

The spurious barks, both the *Surinamensis* and the *Brasiliensis*, are easily distinguished from the genuine by their external characters as well as by the fact that they furnish with acidulated water reddish-brown or brownish red, and not pale yellow infusions, from which no alkaloid is precipitated by ammonia or carbonate of soda; they consequently possess no greater pharmacological value than the barks of our willows, ash and horse-chestnut.—*London Chem. Gaz. from Buchner's Repert.*

MONOPOLY OF YELLOW OR CALISAYA BARK.

[Through the kindness of some friends we have been favored with a copy of the *Report of the Secretary of the Treasury of Bolivia to the National Bank of Bark*, and also with a copy of the *Decree of the Government of Bolivia*, prohibiting bark cutting in the Bolivian forests for three years. The results of these monopolies, by raising the price of Calisaya bark, has been to force the manufacturers of quinine to resort to the inferior but cheaper quinine-yielding barks of Carabeya, Bolivia, and New Grenada.—Ed. Lon. Pharm. Journ.]

Report of the Secretary of the Treasury of Bolivia to the National Congress, regarding the National Bank of Bark.

It is highly satisfactory to me to announce to Congress the establishment of the National Bank of Bark, which has been accomplished in the city of La Paz, by means of the authentic contract entered into between the Government and Messrs. Aramayo Brothers, under the conditions and bases of their proposal and those contained in the supreme resolutions of the 17th and 26th January, 1850. The constant desire of the nation expressed in the solemn legislative acts since the year 1839, had been for an

establishment of this nature, composed of native shareholders, and with sufficient funds to give regularity to the bark trade; purchasing it in the interior of the country at a fixed price, advantageous to the cutters of the country, and selling it abroad at the value due to an article of exclusive production in the woods of Bolivia, and of the first necessity and great demand in the trade of the world.

The free export of bark would be fatal to our commerce, for undoubtedly, a supply greater than the demand would force down the price, subjecting its value to strange vicissitudes and irregularities. A monopoly of four persons, like the extinct one of Pinto and Co., even if it could force up the price to a high point abroad, would neither satisfy the exigencies nor consult the interests of the national industry. Four lucky contractors would thus have used for their exclusive benefit a spring of wealth that should flow abundantly for all the sons of our soil.

The present bank, avoiding both extremes, is that mid-term of justice and general and individual commerce, that common centre which conciliates and cements the interests of the national industry, public wealth, and the governmental treasury.

Consequently the bank maintains the monopoly, and with it the high value and price of bark. Its shareholders, at present eighty in number, are all Bolivians, which is significant of the fact, that in the bank there has been a concentration of capital, the benefits of which will be distributed among numerous Bolivian families. The bank purchases the bark according to its different qualities at the prices of sixty, thirty-five, and thirty dollars per quintal. This produces an immense good to the Bolivian cutters and laborers, who formerly never saw the price of the best bark exceed eighteen or twenty-two dollars a quintal. Finally, the national Treasury receives for duties twenty-five to fourteen dollars a quintal; which, on seven thousand quintals that the bank has the privilege of exporting annually, amount to $142,000, which are paid into the custom-house of La Paz in advance in monthly sums of $11,833.2 reals. Such are the advantages that have been realized, and so great the interest promoted at the same time. It is true, that among the shareholders there are some privileges in the number of their shares, but these are the contracting directors of the bank, those who manage a business so vast and of so great responsibilities, those who guarantee to the Treasury its duties, and to their

fellow-shareholders the results of their management, and who must supply, in case of a deficiency of the associated capital, the necessary funds for the progress of the undertaking. The government was convinced by its own experience, when endeavoring to establish the bank on the basis of the decree of the 18th of June, 1849, that it was difficult, if not impossible, to accomplish it with partners admitted with an equal number of shares. The difficulty of their all granting their confidence to the same parties to direct the establishment; the large remuneration that these parties would then ask for managing and directing the undertaking in which, on the other hand, they would risk little or nothing; the well-grounded apprehension that with the associated capital of but $250,000, they could not meet the necessities and emergencies of a business having to contend with great difficulties in the interior of the Republic, and especially abroad, where still existed accumulated a considerable balance of the bark exported by Pinto and Co., and of that which was so steadily exported during the last period of free egress; the very slowness with which the directing "Junta," named since August of last year, had proceeded in the convocation of shareholders and other operations belonging to its functions, since it had not even installed itself until the arrival of the Government in La Paz towards the end of last November, a slowness which caused a presumption of great delay when the attempt should be made to organize and put the bank in movement; all these difficulties, all these fears and motives were the inducement, apart from the intrinsic merit of the proposal of Messrs. Aramayo Brothers, for the Government to come forward itself at once in this serious affair, and adopt a plan that under the circumstances was certainly the least evil, if not the very best. Accordingly all the citizens being invited to submit their proposals upon the solemn opening of these in a Counsel of the Ministers, and in the presence of a large meeting of the most respectable citizens of La Paz, the unanimous opinion of the Government, the directing "Junta," and the bystanders, decided that of Messrs. Aramayo and Co., to be the most advantageous. The Government, impartial and provident in the management of the gravest national interests of which it is not owner, but administrator, accepted it with certain modifications, which were in their turn accepted by the parties proposing.

Then, Sir, was it that the present National Bank of Bark was installed.

The circular of January 28th, 1850, ordered the convocation of shareholders in all the departments of the Republic, and determined the distribution among them of 500 shares. The present number of shareholders is 80, without including the contracting directors of the enterprise; the former hold 293 shares and the latter 207. It is to be observed, that according to the contract, the directors originally were to have taken but 100 shares, and those which should remain untaken at the end of the term of the convocation, which have amounted to 107. Each share is of $500; the enterprise consists of 500 shares, and the capital stock is $250,000.

The Government entertains flattering hopes of the progress and advance of this establishment. It has but one foe—smuggling. The Government is striving and will strive to repress and chastise this with all the means of action conferred upon it by its authority, and imposed upon it by good faith to its engagements to the shareholders and the entire nation. Of the $142,000 which annually enter into the custom-house at La Paz for bark duties $20,000 have been applied by a decree of the 28th of January, 1850, to the work upon the cathedral of La Paz. It was to be deplored that the construction of so grand a monument of the piety and civilization of that wealthy people should be paralysed by the scarcity of its funds, consequent on the continuance of the treaty with Peru, which has made unavailing the intentions of the law of 11th October, 1844.

The rich fiscal ingress of bark is until now wholly due to the department of La Paz, and it was just that the Treasury should remit a small part of its duties in favor of the first work of that department. The necessity of having the custom-house operations in baling, weighing, and examining the quality of the bark destined for export, verified with the care and minuteness needed to avoid frauds prejudicial to morality and the public purse, has induced the Government to create the office of "Bark Inspector." Its salary is at present fixed at $1,200 per annum, and it has been conferred upon an individual who has merited the three-fold confidence of the Prefect, Municipal Council, and the Directors of the Bank.

August 6th, 1850.

[The following document, forwarded to us after the above report was in type, appears to be alluded to in the report.—Ed. Lon. Pharm. Journ.]

Articles 1 to 9 of the Decree of the Bolivian Government as regards Bark.

Art. 1. Four months after this a National Company will be established for getting and exclusively exporting bark to foreign places, in conformity with the law, 14th Nov., 1834.

Art. 2. The company to be composed of such individuals as shall join it as bidders, who must be Bolivians or foreigners intermarried with Bolivians, and persons domiciliated in the Republic.

Art. 3. The funds of the society to amount to 500 per pesos, divided into 500 shares of 1000 pesos each. No one to have more than five shares.

Art. 4. The Bank only, in the name of the society, can give permission to buy or export the bark got from the mountains of the Republic, with the absolute prohibition to any other individual society or corporation on pain of confiscation, for term of ten years, which may be lengthened as often as necessary, according to the result of the enterprise.

Art. 5. The Society of Bank of Exchange can neither buy nor export during the first two years more than 3000 quintals, in order to wait till the accumulation of the European markets is reduced; 4000 in the third year, and 5000 in the fourth and subsequent ones.

Art. 6. Amongst the quantities named in the foregoing article for the exportation of the Calisaya bark of first quality, may be comprised in the first two years 600 quintals of the Charquisillo and Canuto, and 1000 in the subsequent ones.

Art. 7. For the collection of funds mentioned in Article 3, a directing junta of four individuals is to be formed, who are to be named by Government and presided over by the prefect, with the object to convoke the shareholders, and to submit the propositions and subscriptions of those who wish to belong to the Society of the Bank of Exchange or Exportation.

Art. 8. Two months after the enterprise is announced by the directing junta, and whenever it has got together a number of shares, which for the formation of the bank it shall deem sufficient, the

shareholders entered into the society will be convoked. If by a majority of votes it is resolved to establish the same, giving security for its responsibility, it will be considered installed. From its beginning the society will admit or receive in the two following months the subscriptions which come in until their number is complete. If after the lapse of this time the number should not be complete, the shareholders may form a bank of themselves, taking upon themselves the responsibility of beginning anew their undertaking. No share will be admitted the term of the four said months once expired.

Art. 9. The Bank or National Society shall pay to the principal factors of Paz thirty pesos to the merchants and workers of the mountains for every quintal of Calisaya bark of first quality, twenty for Charquisillo, seventeen for Canuto of the green Calisaya, and $30 duty on Calisaya, $16 on others.

Copy of the Decree of The Bolivian Government.

Considering,

1st. That the number of bark-cutters has caused such an accumulation of bark in La Paz, that the National Bank has not been able to export or buy it at once without exceeding its annual amount, so far as to have actually in deposit the quantity corresponding to the second year, and even a part of the third.

2d. That it is the duty of the Government to protect the bark forests, menaced by imprudent and excessive cuttings.

3d. That the Government, regardful of its contracts, cannot view with indifference the immoderate cutting of bark, which lowers its value, compromising at the same time the interests of the public, of the Bank, and of the Treasury.

Decree.

Art. 1. The cutting of the bark is prohibited throughout the Republic from January 1, 1851, for the three succeeding years.

Art. 2. Bark already cut, or which may be cut up to December 31, 1850, shall be taken to the custom-house at La Paz, by the 1st of March, 1851.

Art. 3. Bark cut after January 1st, 1851, or which may be found on the road, or in any other place, after March 1st, is confiscable by the authorities, by any individual or public officer, who

may take possession of it by the mere act of apprehension, having afterwards to sell it to the National Bank at the stipulated prices.

Lon. Pharm. Jour. Nov. 1851.

Sucre, Oct. 29, 1850.

EXAMINATION OF AN ORE OF CINNABAR, FROM NEW ALMADEN, CALIFORNIA.

By Adam Bealey, Esq., M. A.

[Extracted from a paper in the Pharmaceutical Journal for November, 1851, taken from the *Annual Report* of Liebig and Kopp.—Ed.]

This ore has long been known to mineralogists as abundant and very accessible, but it had not attracted much notice until the recent development of the mineral wealth of California led to more extended inquiry into the actual extent of its distribution, and rendered improved methods of reducing it of great interest and value.

The mine or principal deposit of this mineral, is thus described by Lyman in 1848:

" New Almaden lies between San Francisco and Monterey, near the coast. It is 1200 feet above the plain, and is situated upon a ridge of the Sierra Azul, which consists of a greenish talc-rock.

" The cinnabar is found in nests, in a stratum of a yellowish earth, which is 42 feet in thickness. The occurrence of this mineral has been known to the natives from time immemorial, as the cave of red earth, which they employed for painting their bodies.

" During Lyman's stay, the daily produce from 1,600 lbs. of cinnabar, distilled in a rudely constructed apparatus, was from 200 to 300 lbs. of mercury, and in the last three weeks of his residence the total amount of mercury obtained was about 10,000 lbs.

" Cinnabar had likewise been found in fifteen or twenty other places, within a circumference of a few miles."

A more recent account of this mine was politely communicated by Dr. Forbes, and accompanied a specimen of the ore sent to Pro-

fessor Hofman for analysis, at whose suggestion the following examination was undertaken :—

"The mine of New Almaden is situated in Upper California, near Santa Clara, on the coast, not far from San Francisco. It is the property of a company of English and foreign merchants, and is leased to a company of the same kind.

It has been in active operation for about six or eight months. The vein is very large, and 'crops out' on the surface, where it is worked. The metal is extracted from the ore in two ways :

"First, by a series of large iron cylinder-retorts, heated in furnaces, and discharging their produce into water, where the metal is condensed.

"Secondly, by brick furnaces, in which the fuel (wood) is intermixed with the ore. By these operations, the ore gives from 30 to 45 per cent. of its weight of mercury.

"The mine produced in the month of November, 1850, not less than 127,500 lbs. of mercury.

The ore as exhibited in the specimens sent, some of which weighed as much as 14 avoirdupois lbs. has a bright red color, slightly inclining to purple, and appears to have been imperfectly cleared from a soft, light-brown earth, which can easily be scraped from its surface. It breaks without much difficulty under the hammer, and is afterwards easily reduced to powder, with the exception of some bright crystalline particles, which are extremely hard.

The surfaces of recently broken ore appear much more purple than those long exposed. It is traversed at irregular intervals by very thin bands of white, hard crystalline material, apparently calcareous and siliceous. When in the state of fine powder it has a very brilliant vermilion color, many shades darker than the massive ore. Its sp. gr. is 4.410.

In a preliminary examination, it exhibited the ordinary phenomena of a mercurial sulphide associated with siliceous matter. A portion of the ore was digested with nitro-hydrochloric acid, and the insoluble residue separated by filtration.

The solution examined by the usual methods contained mercury, sulphur, iron, alumina, a trace of nickel, lime, and magnesia.

The part insoluble in acid consisted of silicic acid, and very minute traces of lime and potassa.

In estimating the principal constituents of this ore, the mercury was determined as sulphide of mercury, and as metallic mercury by distillation with lime.

Composition of various Cinnabar Ores.

	Californian.				Almaden, Spain.			Moschellandsberg.			Wolfstein
	1.	2.	3.	Mean	1.	2.	Mean.	1.	2.	Mean.	
Mercury,	69.36	70.13	70.23	69.90	37.84	37.75	37.79	66.60	67.13	66.86	18.00
Sulphur,	11.38	11.21	—	11.29	16.22	—	16.22	11.01	--	11.43	
Iron,	1.23	—	—	1.23	10.36	--	10.36	Insol. residue 17.09	—	17.09	73.31
Lime,	1.40	—	—	1.40							
Alumina,	0.61	—	—	0.61							
Magnesia,	0.49	--	—	0.49							
Silicic acid,	14.30	14.52		14.41	Silicic acid and alumina,		35.12				
				99.33			99.49				

From these numbers it is evident that, provided the specimens represent the average minerals worked, the ore of Calfornia contains nearly double the amount of mercury found in the Almaden ore, and nearly fourfold that of the specimen of Wolfstein, while it approaches the composition of pure cinnabar, even more nearly than the mineral of Moschellandsberg.

CULTIVATION OF NUTMEGS AND CLOVES IN BENCOOLEN.*

BY DR. LUMSDAINE.

The mode of culture adopted in the different nutmeg plantations is nearly the same. The beds of the trees are kept free from grass and noxious weeds by the hoe, and the plough is occasionally run along the adjacent spaces for the purpose of eradicating the Lallang (Andropogon caricosum) which proves greatly obstructive to the operations of agriculture. The trees are generally manured with cow dung and burnt earth once a y :ar in the rainy season, but the preparation of suitable composts and their mode of application are but imperfectly understood. The pruning knife is too sparingly used ; very few of the planters lop off the lower

* From a Paper in the Proceedings of the Agricultural Society established in Sumatra in 1820 ; cited from the Journ. of the Indian Archipelago and Eastern Asia, v. p. 78, Jan., 1851.

verticels of the nutmeg trees or thin them of the unproductive and straggling branches.

The site of a plantation is an object of primary importance, and doubtless the alluvial grounds are entitled to preference from the acknowledged fertility of their soil, and its appropriate organization and capability of retaining moisture, independent of the advantage of water carriage. Several of the nutmeg trees of the importation of 1798 at Moco Moco, are placed in soil of this description; although never manured they are in the highest state of luxuriance and bear abundantly; and I have been informed by a gentleman recently arrived from that station, that the stem of one of them measures 38 inches in circumference. Some of the trees in my own experimental garden, corroborate the truth of this assertion; one of these blossomed at the early age of two years ten months and a half, a degree of precocity ascribable solely to its proximity to the lake which forms the southern boundary. This was the first tree that blossomed of the importation of 1803, which consisted of upwards of 22,000 nutmeg plants. Next to the alluvial deposits, virgin forest lands claim pre-eminence, their surface being clothed with a dark colored carbonized mould, formed by the slow decay of falling leaves and mouldering trunks of trees; and next to these are to be ranked the open plains. Declivities are objectionable from the risk of the precipitation of the mould and manure into the subjacent ravines, by the heavy torrents of rain that occasionally deluge the country. Above all, the plantation must be protected from the southerly and northerly winds by a skirting of lofty trees, and if nature has not already made this provision, no time should be lost in belting the ground with a double row of the Cassuarina littorea and Cerbera manghas, which are well adapted for this purpose. This precautionary measure will not only secure the planter against eventual loss from the falling off of the blossom and young fruit in heavy gales, but will prevent the up-rooting of the trees, a contingency to which they are liable from the slender hold their roots have in the soil. If the plantation is extensive, subsidary rows of these trees may be planted at convenient distances. No large trees whatever should be suffered to grow among the spice trees, for these exclude the vivifying rays of the sun and arrest the descent of the salutary night dews, both of which are essential to the quality and the quantity of the

produce. They further rob the soil of its fecundity, and intermingle their roots with those of the spice trees. It is true that by the protection they afford they prevent frequently the premature bursting of the husk, occasioned by the sudden action of a hot sun upon it when saturated with rain; but the loss sustained in this way is not equal to the damage the spice trees suffer from these intruders. Extensive tracts of land are to be met with in the interior of the country, well adapted for the cultivation of the nutmegs and cloves, and to these undoubted preference is due.

In originating a nutmeg plantation, the first care of the cultivator is to select ripe nuts, and to set them at the distance of a foot apart in a rich soil, merely covering them very lightly with mould. They are to be protected from the heat of the sun, occasionally weeded, and watered in dry weather every other day. The seedlings may be expected to appear in from 30 to 60 days, and when four feet high, the healthiest and most luxuriant, consisting of three or four verticels, are to be removed, in the commencement of the rains, to the plantation, previously cleared of trees and under wood by burning and grubbing up their roots, and placed in holes dug for their reception, at the distance of eighty feet from each other, screening them from the heat of the sun and violence of the winds. It is a matter of essential importance that the ground be well opened and its cohesion broken, in order to admit of the free expansion of the roots of the tender plants, and that it be intimately mixed with earth and cow manure, in the proportion of two-thirds of the former to one-third of the latter. The plants are to be set in rows as well for the sake of regularity as for the more convenient traversing of the plough, which is now to be employed in clearing the intermediate spaces of lallang and other noxious grasses, carefully avoiding to trespass on the beds of the trees. They must be watered every other day in sultry weather, manured annually during the rains with four garden baskets full of the above mentioned compost to each tree, and protected from the sun until they attain the age of five years. They will now be sufficiently hardy to bear the sun, and from that age until their fifteenth year, the compost should consist of equal parts of cow dung and burnt earth, and from eight to twelve baskets full will be required for each bearing tree, a lesser proportion being distributed to the males. From the power of habit the trees will, after the fifteenth

year, require a more stimulating nutriment; the dung ought not, therefore, to be more than two or three months old, and the mixture should consist of two parts of it to one of burnt earth, of which the suitable proportion will be from twelve to sixteen baskets to each tree biennially. In all cases the prepared compost must be spread out in the sun for three or four days previous to its application, in order to destroy grubs and worms that may have lodged in it, and which might injure the roots of the plants.

In all plantations, whether situated in forest land or in the plains, the necessity of manuring at stated intervals has been found indispensable, and is indeed identified with their prosperity. The proper mode of applying it is in a circular furrow in immediate contact with the extremities of the fibrous roots, which may be called the absorbents of the plant. Where there is a scarcity of dung, recourse may be had to the dregs remaining after the preparation of the oil from the fruit of the Arachis Hypogæa, which, in mixture with burnt earth, is a very stimulating manure; or composts may be formed from the decomposition of leaves or vegetable matter of any description. A very fertilizing and highly animalized liquid nutriment for plants, is obtained by macerating human ordure in water in proper pits for four or five months, and applying the fluid to the radical absorbents of the plants. Sea-weed and many other articles may also be resorted to, which will readily occur to the intelligent agriculturist.

During the progressive growth of the plantation, the beds of the trees are to be regularly weeded and the roots kept properly covered with the mould, for these have a constant tendency to seek the surface; the growth of the lateral branches alone is to be encouraged, and all suckers, or dead or unproductive branches, are to be removed by the pruning knife, so as to thin the trees considerably and to admit of the descent of the night dews, which are greatly contributive to their well being, especially during the dry and sultry weather; creepers are to be dislodged, and the lower verticels lopped off, with the view of establishing an unimpeded circulation of air. The conclusion of the great annual harvest is the fittest time for pruning the trees. After the eradication of the lallang, the growth of innoxious grasses is to be encouraged in the intervals between the trees, which will give the plantation the appearance of a park, and the plough is now to be abandoned.

The nutmeg tree is monœcious as well as diœcious, but no means of discovering the sexes before the period of inflorescence are yet known. The relative proportion of male and female trees to each other is also undefined, and is indeed the result of chance. Setting aside, however, all pretension to mathematical precision, the number of productive trees may be roundly estimated at two-thirds of the whole cultivation. As the monœcious plants are productive, the number of male trees necessary to be retained will depend entirely on that of the monœcious kind; all above this number, being considered superfluous, should be cut down and other trees planted in their stead. Were I indeed to originate a nutmeg plantation now, I should either attempt to procure grafts on male stocks on such trees as produce the largest and best fruit, by the process of inarching, notwithstanding the speculative hypothesis of the graft partaking of the gradual and progressive decay of the parent tree, leaving a branch or two of the stock for the purpose of establishing a regular polygamy, by which means the plantation would consist of monœcious trees only; or I should place the young plants in the nursery at the distance of four feet from each other, and force them to an early discovery of their sex, by lifting them out of their beds once a year and replacing them in the same spot, so as to check the growth of wood and viviparous branches. The sex might thus be ascertained on an average within the fourth year, and the trees removed to the plantation and systematically arranged, whereas in the usual mode of proceeding it is not ascertainable in general before the seventh year.

Upon an average, the nutmeg tree fruits at the age of seven years, and increases in produce till the fifteenth year, when it is at its greatest productiveness. It is said to continue prolific for seventy or eighty years in the Moluccas, but our experience carries us no farther than twenty-two and a half years, all the trees of which age that have been properly managed, are still in the highest degree of vigor and fecundity; and for this reason no term for planting a succession of trees can as yet be fixed upon. Seven months in general elapse between the appearance of the blossom and ripening of the fruit, and the produce of one bearing tree with another under good cultivation may, in the fifteenth year of the plantation, be calculated at five pounds of nutmegs, and a pound

and a quarter of mace. I have observed, however, that some trees produce every year a great quantity of fruit, whilst others constantly give very little. It bears all the year round, but more plentifully in some months than in others. The great harvest may generally be looked for in the months of September, October, November and December, and a small one in April, May and June. Like other fruit trees on this portion of Sumatra, I have remarked that it yields most abundantly ever other year. The fruit having ripened, the outer integument bursts spontaneously, and is gathered by means of a hook attached to a long stick, and the mace being cautiously stripped off and flattened by the hands in single layers, is placed on mats for three or four days in the sun to dry. Some planters cut off the heels and dry the mace in double blades, from an opinion that the insect is apt to breed in or about the heels, and that the double blades give a better and more substantial appearance to the mace. The former idea is entirely groundless, for if the article be properly cured, kept in tight packages in a dry situation, and exposed to the sun for five or six hours once a fortnight, there need be no apprehension of the insect; and if it is not, it will assuredly be attacked by it whether the heels be cut off or not; again, the insect is much more likely to nestle within the fold of the double blade, and the fancied superiority of appearance has so little weight with the purchaser, as not to counterbalance the risk of probable deterioration and eventual loss. In damp and rainy weather the mace should be dried by the heat of a charcoal fire, carefully conducted so as not to smoke it or blacken its surface.

The nuts liberated from their macy envelope are transported to the drying house, and deposited on the elevated stage of split neebongs, placed at a sufficient distance from each other to admit of the heat from a smouldering fire beneath. without suffering even the smallest nuts to pass through. The heat should not exceed 140° of Fahrenheit, for a sudden inordinate degree of heat dries up the kernels of the nuts too rapidly, and its continued application produces fissures in them, or a fermentation is excited in them which increases their volume so greatly as to fill up the whole cavity of the shell, and to prevent them from rattling when put to this criterion of due preparation. The fire is lighted in the night. The smoking house is a brick buiding of a suitable size, with a

terraced roof, and the stage is placed at an elevation of ten feet from the ground, having three divisions in it for the produce of different months. The nuts must be turned ever second or third day that they may all partake equally of the heat, and such as have undergone the smoking process for the period of two complete months and rattle freely in the shell, are to be cracked with wooden mallets, the worm-eaten and shrivelled ones thrown out, and the good ones rubbed over simply with recently prepared well sifted dry lime. They are now to be regarbled, and finally packed for transportation in tight casks, the insides of which have been smoked, cleaned, and covered with a coating of fresh water and lime. If packed in chests, the seams must be dammered to prevent the admission of air or water. There is no necessity for sorting them, as previously to their sale they are classed into sizes in the Company's warehouses in London.

The mode generally practised in preparing nutmegs for the markets, is to dip them in a mixture of salt water and lime, and to spread them out on mats for four or five days in the shade to dry. I am, however, convinced from much experience that this is a pernicious practice, not only from the quantity of moisture imbibed in this process encouraging the breeding of insects and rendering the nuts liable to early decay, but from the heating quality of the mixture producing fissures and occasioning a great loss in the out turn; whereas by liming them simply in the dry way as I have recommended, the loss ought not to exceed 8 per cent. In May, 1816, I made some experiments on this subject. I cracked a quantity of nutmegs that had been smoke-dried for two months, and distributed them into four equal portions. I prepared the nuts of one parcel with a mixture of lime and salt water; those of the second were rubbed over merely with fine well dried shell lime such as the natives use with their betel, although I have no doubt but that recently prepared and well sifted common lime would answer equally well; those of the third parcel were mixed, unlimed, with one-third of their weight of whole black pepper; and those of the fourth, also unlimed, with the same proportion of cloves. They were then put into separate boxes with sliding tops, and numbered 1, 2, 3 and 4, in the order I have mentioned them. At the expiration of the first year they were all sound. After that of the second, I found three worm eaten nuts in No. 1. and two in No. 3,

but those in Nos. 2 and 4 remained untouched. The injured nuts were allowed to remain, and after the lapse of the third year, five worm eaten ones were discovered in No 1, three in No. 3, and two in No. 4, those in No. 2 being in their original state. Four years and four months have now elapsed since the commencement of these experiments, and upon examining the several parcels the other day, the number of decayed nuts has not increased in Nos. 1, 3 and 4, and those in No. 2 are as good as the day they were put into the box. These experiments not only prove the superiority of liming in the dry way, but also the fact that the progress to general decay in a heap of nutmegs, even after the insect has established itself, must be a work of years. In the shell they will keep for a great length of time. I have myself kept them in this state for six years, and when cracked they were found perfectly sound. From the report of the London brokers, however, they will not answer in Europe on account of the heavy allowance for shells, which is one-third of the weight; but the Chinese merchants are in the daily habit of exporting them to Pinang and China, where they are in request. It is stated on the best authority, that unlimed or brown nutmegs, as the home dealers call them, mixed with cloves as in experiment No. 4, are highly esteemed in England, and even preferred by some to the limed produce; most probably from the greater facility of detecting the flaws in them in their naked state.

Although the clove tree attains great perfection in the red mould of these districts, it is more partial to a less tenacious soil. Its cultivation has been established for many years in the West Indies and at Bourbon, and is of secondary importance only. The mother cloves are planted in rich mould at the distance of twelve inches from each other, screened from the sun and duly watered. They germinate within five weeks, and when four feet high are to be transplanted at intervals of thirty feet, with a small admixture of sand with the red mould so as to reduce its tenacity; and to be cultivated in the same mode as the nutmegs, only that when full grown they require less manure in the proportion of one-third. They yield generally at the age of six years, and at that of twelve are in their highest state of bearing, when the average produce may be estimated at six or seven pounds of marketable fruit each tree during the harvest, which takes place in the rainy months, but with us they have hitherto borne two crops in three years only.

The fruit is terminal, and when of a reddish hue is plucked by hand, so that the process of gathering is tedious. It is then dried for several days on mats in the sun, until it breaks easily between the fingers, and assumes a dark brown color. It loses about 60 per cent. in drying. When past its prime the clove tree has a ragged and uncombed appearance, and I am led to suppose that its existence is limited to twenty years, unless in very superior soil, in which it may drag out a protracted and unprofitable state of being to the period of perhaps twenty-four years. Hence it becomes necessary to plant a succession of seedlings when the old trees have attained eight years of age, and this octennial succession must be steadily kept in view.

With reference to the number of laborers, cattle and ploughs necessary for a plantation of 1000 nutmeg and clove trees, after the ground has been thoroughly cleared of underwood and stumps of trees, I consider that seven Chinese or active Bengalee laborers, fifty head of cattle and two ploughs, would be sufficient for all the purpose of the cultivation, with the exception of collecting the clove harvest, which, being a very tedious process, would require an extra number of hands; and indeed the best plan would be to gather it in by contract.—*American Journal of Science and Arts, November*, 1851.

ON THE ETHERIAL EXTRACT AND PROXIMATE CONSTITUENTS OF MALE-FERN ROOT.

By H. Bock.

The root was exhausted in a small displacement apparatus with ether, and the ether then distilled off. It had acquired scarcely any odor, had a neutral reaction, and did not become turbid on being mixed with water. The extract from 2000 grs. of the powdered root was of a grayish brown color, very thick, and had separated into two layers, the upper one of which was oily and of a green color, the lower one brownish and more resinous. On distillation with water, the product yielded a mere trace of essential oil to ether, and which resembled the oil above

described. The residue was digested with water containing ether, the ether separated by distillation and the water by filtration. The filtered liquid was turbid, had an astringent taste, and left on evaporation 6·5 grs. residue, which dissolved readily in water excepting a few brown flakes. The concentrated solution had a feeble acid reaction. Solution of isinglass and albumen produced copious precipitates, perchloride of iron and peracetate of iron gave grayish brown precipitates, and lime-water a reddish brown precipitate, which did not dissolve in an excess. Nitrate of silver caused a bulky flocculent precipitate, and perchloride of mercury a light green precipitate. Consequently what the water had removed from the etherial extract was a tannic acid, belonging to those which strike a green color with iron.

The etherial extract was now treated with alcohol of 0·840, first in the cold and then boiling. It acquired a reddish brown color, and left on evaporation 56·5 grs. of a reddish brown resin, transparent at the sides, and which on long exposure to the air became darker, harder and brittle. On being heated, it soon softened and became liquid; it had a somewhat aromatic odor and bitter taste; it dissolved readily in ether and spirits, and was heavier than water. On mixing the spirituous solution with water, it became turbid, had an acid reaction, and some time elapsed before the resin separated. The resin dissolved readily in oil of turpentine and likewise in ammonia. Nothing separated from the solution on the application of heat. It likewise dissolved in sulphuret of carbon; when heated with carbonate of potash, it dissolved in it, expelling the carbonic acid; it dissolved readily in caustic potash; the resin soap was very soluble in water, and was not separated by chloride of sodium even on ebullition. This resin consequently belongs to the strongly electro-negative hard resins of Unverdorben. In order to separate completely the resin from the fat oil, the residual ether extract was treated with alcohol of 0·780, and what was left on evaporation digested with alcohol of 0·840. The complete separation of the resin from the oil is difficult, and can only be accomplished by solution in ether and alcohol of various strength. In this manner 10 grs. more of resin were separated. The fatty oil which now remained, after treating with water and spirits, was thick, dark green, and easily soluble in ether. The ether solu-

tion was poured into a narrow-necked flask, and the ether allowed to evaporate slowly in the cold. After some time, a verrucoid, yellowish-white mass had separated on the sides of the vessel. The oil was decanted, again dissolved in ether, and exposed to a temperature of 18°, and this operation repeated as long as any thing separated. The adherent oil was removed from the solid mass by rinsing with a little cold ether. This substance, examined under a lens, appeared crystalline; but no crystalline form could be detected; it was inodorous and tasteless, adhered between the teeth like wax, was soluble in much ether, partially soluble in boiling alcohol of 0·780, but separated for the greater part on cooling. The solution was neutral. Oil of turpentine readily dissolved it; nitric acid has but little action upon it; caustic potash dissolves it readily, and nothing separates on the addition of chloride of sodium. Concentrated sulphuric acid mixes with it, colors it reddish, and diffuses an odor of butyric acid. On pouring water into this mixture, a reddish precipitate fell. This substance has most resemblance to wax, and differs from it principally by its solubility in oil of turpentine. It appears to form a peculiar *stearine*, like those which separate from the fatty oils, after long standing and in the cold. It is most easily separated from the fatty oil after removal of the tannic acid and the resin; cold likewise facilitates the separation. After standing for one year, the above amount of oil had furnished 19.1 grs. of stearine; no further separation was observed.

The quantity of the fatty oil which now remained amounted to 108 grs. It had a dark green color, but at first was bright green, probably owing to the presence of chlorophyl, which grew darker with time. It was of the consistence of oil of almonds, but did not congeal even at 9° F. The statement of Liebig, in Geiger's 'Handbuch der Pharmacie,' that the oil congealed like butter at 32°, is probably owing to the oil not having been pure, and still containing stearine and resin; its specific gravity at 59° is 0.942; it has a peculiar odor and a bitter taste. It is sparingly soluble in spirit of 0·820; alcohol of 0·780 dissolves some of it in the cold, and nearly the whole on the application of heat, but the greater portion of what has dissolved again separates on cooling. It has no acid reaction.

Treated with solution of caustic potash, it forms a greenish brown soap, which floats upon the solution. By treating the dissolved soap with muriatic acid, oleine and margaric acid could be separated according to Chevreul's method. From the mother-liquor combined with the wash-waters, after the addition of sulphuric acid and separation of the sulphate of potash, glycerine was obtained. With the acid nitrate of the protoxide of mercury, the oil solidified. With fuming nitric acid of 1·55 it likewise formed a solid mass; it consequently belongs to the non-siccative oils.

All the constituents of the root arranged together give in—

1000 parts of dry root,		21 parts of ash,	
0·4	essential oil.	1·1	sulphate of lime.
60·0	fat oil.	0·4	phosphate of magnesia ($MgO+PO^5$)
10·0	stearine.	1·6	phosphate of lime ($CaO+PO^5$).
40·0	resin.	2·2	chloride of calcium.
100·0	starch.	0·4	chloride of sodium.
4·0	vegetable gelatine.	0·1	silica.
35·0	albumen.	9·4	carbonate of lime.
33·0	gum.	5·5	carbonate of potash.
110·0	sugar.	0·3	loss and traces of perphosphate of iron.
100·0	tannic and gallic acids.		
21·0	pectine.		
15·0	amylaceous fibre.		
21·0	ash.		
450·6	fibre and loss.	21·0	
1000·0			

Chemical Gazette, Oct. 1, 1851.

ON THE BEST MODE OF PREPARING THE JUICE OF DANDELION, SO THAT IT SHALL CONTINUE IN PERFECT PRESERVATION THROUGHOUT THE YEAR.

The following mode of preparing the juice of dandelion, advised by Mr. Donovan (*Dublin Medical Press*, June 11th, 1851,) is worthy the attention of pharmaceutists :—

" The dandelion abounds in a milky juice; it has no smell; its taste when recent is very bitter, the roots more so than the leaves. By drying, the bitterness is destroyed, as happens to many other vegetable substances. I have observed that the juice of the recent

roots and herb loses its bitterness by long boiling, and that it even assumes a saline sweetish taste, such as is observable when it is extracted from plants dug during the cold months of the year. The change happens more easily in the juice of the leaves than in that of the roots; yet a decoction of the roots long boiled retains but little of its bitterness. The recent juice of the roots, if evaporated to dryness and restored to its original bulk by the addition of water, will be found by far less bitter than before. The solid extract is therefore a bad preparation, and as Lewis observes becomes worse still by being kept. Indeed the extract of commerce has but little bitterness, and is often so sweet as to suggest a suspicion that it contains a foreign admixture: I have sometimes thought that it was the sweetness of Spanish liquorice. Its color, which ought to be brown, is generally black.

"The bitterness is due to the presence of a proximate principle said to be crystallizable. When this has been impaired or removed by boiling, a sweetish, saline, and even acidulous taste is discoverable: it naturally belongs to the juice; for, besides the bitter principle, it is known to contain phosphates, sulphates, muriates, and tartaric acid, or a bitartrate, which are the useful ingredients: along with uncrystallizable sugar, gum, inulin, caoutchouc, and some other matters of no medicinal importance. The bitter principle and salts are the constituent ingredients which claim the attention of the practitioner; and it is to their preservation, by whatever process the juice is prepared, that the apothecary should devote his attention; for, as Dr. A. T. Thomson truly observes, 'much depends on the nature of the preparation.'

"Keeping the foregoing observations in view, the best mode of conservation is obvious. The whole herb as soon as dug is to be washed immediately, well pounded, and the juice extracted by means of the press. Delay in pounding the roots will soon begin to impair their bitterness; and even the expressed juice will speedily begin to change unless put in process of preservation very soon after expression. When the juice has been pressed out, the marc, still containing valuable matter, is to be well mixed with as much water at 200° as will bring the whole to about the consistence of a pulp. After standing two hours, the liquor is to be pressed out, added to the former product, and the mixture is to be very slowly evaporated in a wide earthen vessel, with constant agitation,

until it be reduced to one-half. We now have the salts, (which in a medical point of view are of great importance) and other ingredients in a much more concentrated form than in the original juice, but the bitter principle has been somewhat impaired in efficacy during the evaporation. Even if this deterioration had not taken place, the juice does not in its natural state contain a sufficient ratio of the bitter principle to act with adequate effect as a tonic when so moderate a bulk of the liquid is administered as is convenient or suitable. On this account a quantity of roots without leaves, equal to the weight of whole herb previously employed, must be pounded and expressed. This bitter juice, which is very small in quantity, not in some seasons more than a gallon from 112 pounds, is to be laid aside until the residual marc, from which it has been pressed, has undergone a new process, which is as follows: The mixture of juice obtained from the whole herb and the evaporated infusion of its marc is again to be brought to a boil, and at that temperature is to be infused on the marc of the roots; the temperature will thus be reduced below the injurious degree, but will be still sufficient for extraction of the bitter. When cold the liquor is to be strongly pressed out, and mixed with one-sixth of its total measure of spirit of wine. The mixture is to be poured into common quart bottles, but they are not to be entirely filled. Appert's process somewhat modified, must now be resorted to. A large shallow vessel containing cold water is to be placed on a fire: the nearly filled bottles are to be immersed in the water as high as the liquor within: the water is to be slowly brought to about 180°: the bottles are to be withdrawn, and the reserved juice obtained from the roots is to be added to each in equal quantities. These quantities ought to fill the bottles so high in the neck that when the corks are driven in there will be the smallest possible intervening space. The corks being cut off close to the glass, the mouths are to be sealed with hard bottle wax: and the bottles set by, inverted, in a cool place.

"The bitter principle, obtained in the second part of the process, having been scarcely exposed to heat, is as perfect as it existed in the roots. Heat is highly injurious to the active principle of various vegetable substances. The root of Arum maculatum is so poisonous and so acrid that it will blister the skin; but by boiling and even drying it becomes harmless, and in that state is by some

nations used as food. Mezereon bark in its recent state also blisters the skin, but by the moderate heat of drying it loses this power. The seeds of palma Christi are acrimonious and violently cathartic; yet when boiled they are used as an article of diet. The root of the cassava, which, like the dandelion, yields a milky juice, is in its natural state a violent poison, but when boiled it becomes harmless: the leaves, equally poisonous, are by heat rendered innocuous, and are eaten as a culinary vegetable: tapioca the food of the invalid, is obtained from the roots. The effect of heat on onions and garlic is known to every one.

"The quantity of spirit of wine here made use of, although it conduces to the preservation of the juice, is by itself insufficient; hence the necessity of Appert's process. Each ounce will contain about one drachm of spirit of wine; more might be disagreeable or inexpedient.

"By the foregoing process, we have dandelion juice in a degree of perfection not very inferior in qualities to that which exists in the plant in its natural state; and in a condition to retain its virtues throughout the year."—*Am. Jour. Med. Sci.*

PHARMACY IN SWEDEN.

By Dr. N. P. Hamberg,

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As the Pharmaceutical Journal already contains various articles upon the state of Pharmacy in different countries, and as the Editor has expressed a wish to have an article upon Pharmacy in Sweden, I have very great pleasure in communicating my knowledge upon the subject, hoping that if the notice is in some degree incomplete, it will be excused, inasmuch as it is written from memory.

In Sweden, as well as in many other countries, it has been the object of Government, by laws and other regulations, to provide that the people for a fixed moderate price, should obtain unadulterated medicines; and by means of limiting the number of shops, and preventing quacks or other incompetent persons from

interfering in the Pharmaceutical trade, have secured for the Apothecaries or Dispensing Chemists (*Apothekare*) a sufficient competence.

That the attention of the Swedish Government for a long time has been directed to Pharmacy is plain, from a royal resolution passed in the year 1663, which commands the publication of a Pharmacopœia (*Pharmakope*) and a price list of medicines (*Medicinal Taxa.*) The first Pharmacopœia was published some years afterwards (1686), under the name of "Pharmacopœia Galenochymica," and about the same time a price list of medicines.

The first edition of Pharmacopœia Svecica was published in 1775, and new editions according to the progress of science from that time to 1845, which is the sixth and last edition. The Swedish Pharmacopœia is written only in Latin.

COLLEGIUM MEDICUM.—The superintendence and inspection of the Pharmaceutical as well as of the Medical establishments in Sweden are committed to the charge of a Collegium Medicum (*Konglig Sundhets Collegium,*) whose members (*Medicinal Rad*) are nominated by the King; and every candidate for this office must be a Doctor of medicine, whose degree has been obtained by passing an examination.

APPRENTICESHIP.—Any youth who may wish to enter as apprentice in an Apothecary's shop, must be fifteen years of age, and ought to have gone through a school-course of History, Geography, Mathematics, Latin, and Modern Languages.

ASSISTANT, OR PHARMACIÆ STUDIOSUS.—The Apothecary must announce the name of the apprentice for registration in the Collegium Medicum, and provide for his instruction in Botany, Chemistry, and Pharmacy during the apprenticeship, which lasts from three to four years; and after which time the student is authorized to pass an examination in Botany, Chemistry, Pharmacy, Latin, and Modern Languages. This examination must be passed in Stockholm, in the Apothecaries' Society (*Apothekare Societeten*), and in the country before the official Physician of the province, together with the Apothecary who is the master of the apprentice. After this examination his oath is taken in compliance with the law and the official Pharmaceutical regulations, and he is now declared "*Pharmaciæ Studiosus,*" and capa-

ble of exercising the functions of an assistant in a shop, and also answerable for the prescriptions prepared by him; and by way of a check he must always sign his name to the label of the prescription.

(The apprentice or scholar is not answerable, and in consequence not allowed to prepare any prescriptions, he may sell innocent medicines only, as elder and chamomile flowers, juniper-berry, gummi acaciæ, &c.)

Pharmaceutical Institution.—After serving as an Assistant in a shop for three years, and producing a testimonial of the fact, he may now enter as Pupil at the Pharmaceutical Institution (*Pharmaceutiska Institutet*) in Stockholm, and there attend the lectures which are read in Botany, Materia Medica, and Pharmaceutical Chemistry, from the beginning of October to the end of May, with a few weeks vacations at Christmas. At the same time he must work two days a week in the operations of the laboratory.

The fees for the lectures and the course in the laboratory are together about £1. The pupil has free admission to the lectures in Zoology, Botany, Materia Medica, and Chemistry, at the Royal Caroline Institution (*Konglig Carolinska Institutet*,) and to the excursions of the Assistant Professor of Botany, which take place during the summer months, May, June, July, and August, in the environs of Stockholm.

After finishing the course in the laboratory, the duration of which depends upon the capacity of the pupil, he may request a private trial (*tentamen*) by the Professors in the prescribed branches of science, viz., Botany, Zoology, Materia Medica, Theoretical and Pharmaceutical Chemistry, and Toxicology.

If he can present in the Collegium Medicum a certificate from the Professors, of their satisfaction with the trial, a day will be appointed for examination, which is conducted by two Professors at the Royal Caroline Institution, and two of the Apothecaries in Stockholm before a member of the Collegium Medicum. During the examination, whoever wishes, is allowed to be present, and all the questions are registered in a book kept for that purpose, and a note made whether or not the answers are correct. And the examiners express the merits of the candidates by the

following different terms: *laudatur*, *cum laude approbatur*, *approbatur*, *cum approbatione admittitur*, and last of all, *admittitur*.

The examination is not passed unless the candidate receive the approbatur of all the examiners.

Provisor and Apothecary.—After the examinee has taken an oath before the Collegium Medicum to comply with the laws and pharmaceutical regulations, he is declared "Provisor and Apothecary," and obtains a diploma to that effect. He is now at liberty to purchase by agreement an Apothecary's shop, if one becomes vacant, or through nomination, if a new one is required in any part of the country.

The right (*privilegium*) of dispensing medicines in a shop, properly procurable by personal permission from the Government, and which should cost only about £4 or 5 for the diploma, has become a traffic, and the price has gradually risen to such an extent, that at the present time the *privilegium*, or good-will of one of the best shops, is sold for about £3000—a sum beyond the reach of a poor though clever student.

Those who have been interested in the success of Pharmacy in Sweden, have proposed to mortgage (*amortisera*) the privileges by a loan; but their benevolent endeavors have been stranded by the difficulty of procuring so large a sum of money necessary for mortgaging the privileges over the whole of Sweden.

When a person through purchase or inheritance has become possessed of an Apothecary's shop, he must announce it in the Collegium Medicum in order to obtain from the Government confirmation of the privilege for himself.

If in any part of the country a new shop is required, the Collegium Medicum announce it, an propose three of the most deserving candidates. The Government nominates one of them. It is for the most part in country places, at a distance from any town, that new Apothecaries' shops are allowed for the convenience of the public. In the larger towns, on the contrary, they are rarely permitted.

The number of Apothecaries' shops in Stockholm is fourteen, to a population of 90,000. No new shop has been permitted during the last twenty years, as the number has been found more than sufficient. For in Sweden, as in many other countries, it

is observed that the larger number of inhabitants and the fewer shops the better are the medicines.

The Apothecaries have, in consequence, a sufficient competence ensured in their calling, and are not compelled to enter into other trades. Hence it is they love their profession, and by dispensing medicines of the best quality, strive to obtain the confidence of the authorities and the public. On the contrary, if the number of shops is very large—or, still worse, unlimited—the Apothecary or Chemist cannot gain a subsistence from his profession, and is, therefore, obliged to seek in other trades what he cannot find in his own ; and Pharmacy instead of being the main object, is reduced to an insignificant rank, and reflects no credit upon its followers.

Under such a system, if each Apothecary train up one or more Assistants, the number of candidates for shops will in time become extravagantly large, and the difficulty of controlling them increases in the same proportion.

(Some of the Apothecaries in Sweden have endeavored, in consequence, to employ Assistants only, and no apprentices, in order to obviate too great competition.)

The Apothecaries' Shops (Apothek.)—The shops in the towns are for the most part large, and internally are often arranged with considerable elegance. The laboratory, according to the regulations, must contain a steam apparatus for preparing decoctions, extracts, aromatic oils and waters, &c.

Decoctions and infusions must be prepared *extempore.*

Tinctures must be kept in a room in which the temperature is not under 15° Celsius, in order that the dissolved materials may not be precipitated by the cold.

Native vegetables must be renewed every year, and the old stock destroyed.

The best medicines, if there are several kinds in commerce, must always be written for.

Every shop has a sign of its own, derived from some animal or other object. To each medicine prepared according to a prescription must be attached a label, on which is the name of the shop.

The so-called homœopathic Apothecaries shops do not exist in Sweden. They are not necessary, inasmuch as homœopathy does

not seem likely to be long-lived there, and will soon become an historical curiosity. It is very probable—indeed, I believe it—that in Sweden as in other countries, many hysterical ladies, or *malades imaginaires*, male as well as female, have, perhaps, derived comfort from the potential homœopathic sugar-grains and interesting conversations with the homœopathic long-suffering Physician. But Swedes, in general, do not like this kind of medicine; no foreign, and only one Swedish Physician practices homœopathy in Stockholm, and, in the country, I believe, not a single one.

PRESCRIPTIONS (RECEPTER) AND THE PRICE-LIST OF MEDICINES (MEDICINAL TAXA.)—The Chemist must put on every prescription the price, which must be according to the rate of the price-list at that time. The Swedish price-list of medicines is revised every year and the price is changed according to the market-price of the drugs.

Medicines for external use ought to have a colored label, and powerful medicines are to be sealed.

The Chemist must prepare medicines according to the Swedish Pharmacopœia, unless the physician has (*expressis verbis*) prescribed otherwise. The Chemist is forbidden to prepare prescriptions of other than physicians who are allowed to practice in Sweden; and a list of them is every year published by the Collegium Medicum.

As a physician is not allowed to keep an Apothecary shop, because he has no Pharmaceutical diploma, so the Chemist is not allowed to practice in medicine: the privilege of that is granted only to such persons as have gone through a complete medical course at any of the Swedish Universities in Upsala or Lund, or at the Medico-Chirurgical Academy of the Royal Caroline Institution in Stockholm. To gain admission into the last-mentioned Academy, the student must have passed at some of the Universities a philosophical and philological examination.

Foreign physicians, unless they can present a diploma as Doctor of Medicine from a well-known University, are not allowed to practice medicine in Sweden without a so-called colloquium familiare in the Collegium Medicum, or medical course at the Royal Caroline Institution.

As the time of the Apothecary is not employed in medical

practice, and as his competence is sufficient, he can, if he loves science, employ his spare hours with tranquillity in working in that branch of science which he most affectionately embraces.

If, in general, a greater scientific activity of the Pharmaceutical profession in Sweden is to be desired, we must, however, with pleasure remember that private individuals, distinguished in other countries for original scientific researches, have been met with and are still to be found in Sweden. I will only here mention the most distinguished:—For about a century ago lived in Köping (a very small, and, for the greatest part of the world, unknown town in Sweden) an Apothecary and Chemist, who, with great eagerness, was laboring in Chemistry. The good Burghers in Köping very likely thought him a clever Apothecary, but none of them could foretell that their diligent friend the Chemist, *Carl Wilhelm (Charles William) Scheele*, in his small insignificant shop, was operating with experiments the result of which should astonish the whole scientific world.

Inspection of the Shops.—The Chemists' shops in Sweden must, according to the regulatious, be inspected every year. These inspections are performed in Stockholm by two professors or assistant-professors to the Royal Caroline Institution, in presence of two Members of Collegium Medicum, and in the country of the official Physician of the province, together with a magistrate.

As the official Physician of the province has not time enough for Pharmacognosy, the Collegium Medicum has of late proposed to the Government a change in inspecting the shops in the country, so that, as in some parts of Germany, the whole country will be divided into a certain number of districts, and every district obtain a travelling inspector.

Should the inspector find any adulterated or bad medicine it must be immediately destroyed.

If an Apothecary is three times found to have sold adulterated medicines, he directly loses his privilege, and must give up his shop to another person.

It is at the same time a duty and a satisfaction for me to state, that medicines in Sweden are commonly very good, and when adulterated articles are met with are usually such as are imported.

Poisons, or other noxious medicines, which in the Swedish Pharmacopœia have this mark ☿, must not be sold without a sufficient prescription, which ought to be retained by the Chemist, and not repeated without a note from the Physician.

Poisoning is, consequently, very rare in Sweden, and when practiced it is commonly by means of white arsenic, which has probably been obtained from a glass manufactory.

Secret medicines are forbidden in Sweden, in spite of which charlatans try to sell secretly their all-relieving medicines, but they seem more and more to lose the confidence of the public, and their credit, too, sinks in the same proportion as the reputation of the scientific Physician increases.

Varieties.

On Schönbein's Ozone. By Professor Faraday.*—Professor Faraday commenced by stating, that considerable mystery was attached to the subject which he proposed to bring before the members on the present occasion, namely, *Ozone*. This name had been gived by Schönbein, of Basle, to a substance or condition of matter which manifested itself under very peculiar and widely different circumstances. Schönbein regarded it as an independent body, and a constituent of the atmosphere; but in his (Professor Faraday's) opinion, it was nothing more than an allotropic condition of oxygen. It was never manifested except where oxygen was present, and where, at the same time, water, in a liquid or vaporous condition, was found. No substance had ever been separated from the atmosphere where ozone existed; but its presence was manifested, not merely by the strong smell peculiar to it, but by certain well marked chemical properties which the atmosphere containing it possessed.

When electricity is produced from a powerful machine, and allowed to be discharged by a point, there is a feeling of a current or aura as of vapor escaping, and at the same time a remarkable odor. If, during the passage of the electricity, a piece of paper moistened with a solution of iodide of potassium and starch, be brought near, the discharge causes the production of blue iodide of farina. The blue color thus produced is the result of

* Lecture in the Royal Institute, June 13th, 1851.

the oxidation of the potassium by the *ozone*, and the setting free of the iodine. This is one of the best tests for the presence of ozone. It was formerly supposed that nitric acid was produced by the discharge of the spark, and that the decomposition of the iodide was occasioned by this acid as a result of the union of oxygen with nitrogen in the air: but this theory will not account for the smell and other properties of this extraordinary agent.

Schönbein produces ozone in very large quantities by introducing into capacious bottles, with glass stoppers, pieces of cut and clean scraped phosphorus, with small quantity of water, so that the phosphorus may be partly in and partly out of the liquid. A vapor slowly rises in a current. After ten or twelve minutes the ozone is produced, and may be procured in admixture with oxygen and nitrogen by removing the phosphorus at a pneumatic trough, and thoroughly washing the interior of the bottle with water, in which ozone is insoluble. This body is thus separated from the vapor of phosphorus and phosphorous acid. (This experiment was performed in three bottles and several bottles of ozone previously prepared were now brought forward.) On introducing paper, wetted with starch and iodide of potassium, into one of the bottles, there was an immediate indication of the presence of this principle, by the production of a dark blue iodide of starch. Another remarkable property possessed by ozone was seen in its bleaching powers. Some ounces of a solution of sulphate of indigo were gradually poured into a bottle containing ozone, and shaken, when the color was as completely destroyed as if chlorine or chloride of lime had been present. A very small quantity of ozone would thus entirely discharge the color of a very large quantity of sulphate of indigo.

It has been already stated to be so little soluble in water, that a bottle containing it may be repeatedly rinsed with water without losing its ozonic contents. If, however, the stopper be removed, and it is exposed to air, it soon passes off. Ozone appears to be entirely destroyed by heat; or, at any rate, its production by electricity ceases when sparks are received from a red-hot metallic point. This fact was ingeniously illustrated by insulating a small galvanic battery, capable of raising at pleasure a platina ball to full redness; the battery was made part of the machine, and the platina ball the terminal point from which the discharges of electricity were received. The machine was set to work, and it was clearly and distinctly proved by Professor Faraday that the discharges from the red-hot platina ball produced neither the aura, the smell nor the decomposing effects on iodide of potassium and starch which were immediately manifested when the ball was allowed to cool, and the electric fluid was then passed through it.

The oxidizing properties of ozone are indicated upon metals which in practice it is rather difficult to convert to oxides, namely, silver. A piece of polished silver had been placed in a bottle of ozone for several hours,

and had acquired a distinctly brown tarnish, not from sulphur, but from a process of ozonation, or, in other words, oxidation. Polished lead similarly treated was also oxidized. Ozone had always a tendency to bring metals and metallic oxides to their highest degree of oxidation. In this respect it was the most powerful oxidizer that was known. A tube containing several rings of metallic arsenic had been placed for a short time in a bottle of ozone. The metal had entirely disappeared, and had become transformed into arsenic acid. Paper wetted with a solution of proto-sulphate of manganese was introduced into a bottle of freshly prepared ozone, and in the course of a short time black spots appeared over the surface, proving that the manganese had passed to a higher degree of oxidation.

Nitrogen and sulphur are easily oxidized by it. Schönbein succeeded in procuring a quantity of nitre (of which a crystallized specimen was shown) by the agency of ozone in contact with nitrogen (of air) and potash. Sulphur was also converted to sulphuric acid. Paper stained with sulphuret of lead was immediately bleached when exposed to an ozonic atmosphere. Some curious experiments of Schönbein's were now shown, in which portraits and inscriptions were seen in white letters on a dark ground, as a result of placing stenciled metallic plates on paper which had been stained brown by sulphuret of lead. The uncovered spaces had been exposed to light and air, or *insulated*. The result was that in these spots the sulphuret of lead had entirely disappeared, having been converted into colorless sulphate of lead by the oxidizing action of ozone.

The alleged bleaching properties of solar light on colored articles are thus probably due to the agency of ozone,—in other words, to a process of oxidation and alteration of color.*

Sulphuretted hydrogen, phosphuretted hydrogen, and all foul effluvia, are speedily oxidized and destroyed by ozone. It is, therefore, the great purifier of the air; and, owing to its continual exhaustion by oxidating processes, it is difficult to discover the presence of ozone in large and populous places, or in close and crowded dwellings. In the open air of the country, and on the sea, it constantly exists in a proportion which is probably subject to great variation, although ruled by laws which are at present unknown. Schönbein had contrived an *Ozonometer* for testing the amount contained in air. It is prepared by immersing paper in a solution made of one grain of iodide of potassium, ten grains of starch, and 200 grains of water. The paper is dried, and when intended for use, is exposed for some time to the air. There is no change until it is wetted with water, when, if ozone was present in air to which it had been exposed, a blue color will appear, the intensity of which varies according to the quantity of ozone present and the

* This hypothesis should have its correctness tested by the exposure of colors known to fade, in hermetically sealed tubes. Oils, it is well known, are bleached in close bottles; but they may contain air, and wherever there is air there is ozone, a very small portion of which possessses remarkable powers of bleaching.

length of exposure. The ozonometer consists of a series of papers thus colored in different degrees, and bears some analogy to the cynometer long since proposed by Humboldt.

Professor Faraday stated that, during the last autumn, when at Brighton, while walking close to the sea-shore, he exposed some strips of this prepared paper to the current of air coming over the sea, and, on subsequently wetting the paper, the presence of ozone was distinctly manifested by the blue color produced. On another occasion he received on the same paper the current of air blowing over the town, but no trace of ozone could be detected in it. When he went, however, on the windward side of Brighton, so as to catch the air blowing over the downs before it reached the town, ozone was strongly manifested by the result. It was thus established that in populous places there is a constant consumption of this principle.

It had been shown that ozone was evolved with the ordinary electricity of the machine; it was now proved that the current of the battery equally leads to its production. Water was decomposed by a Grove's battery, and the oxygen and hydrogen evolved were conducted through a tube in which cotton soaked in potash had been placed to arrest any traces of acid. The gases evolved at the end of the tube decomposed the iodide of potassium on starch-paper, and gave the usual indication of the presence of ozone.

Ozone is evolved in numerous chemical processes. If pure ether, mixed with water, be introduced into a wide-mouthed capacious bottle, and the vapor allowed to become diffused, it will be found that litmus paper introduced is not reddened, and that starch-paper prepared with iodide of potassium is not rendered blue. If, however, a glass rod be made hot in the flame of a spirit-lamp, and then introduced into the vapor of the bottle, litmus paper held above the rod becomes strongly reddened, and the iodide of potassium paper intensely blue. In the oxidation of ether vapor at a low temperature, ozone is evolved.

Ether, in its ordinary state, has no bleaching properties; but the ether thus treated had acquired the power of discharging the color from a large quantity of sulphate of indigo.

Essential oils are thickened by long exposure to light and air; they become ozonized and their properties changed. This was illustrated by reference to oil of turpentine. Freshly rectified and pure oil of turpentine was proved, by admixture with sulphate of indigo, to have no bleaching power. A small quantity of oil, which had been exposed to air and light (the air in a bottle half full,) destroyed the color in a few minutes like chlorine.

We cannot doubt that ozone exerts an important influence on the atmosphere, and, therefore, on the health of animals and vegetables. Schönbein, who is rather sanguine in his views, considers, from the irritant properties of ozone, that an undue proportion of it in air may give rise to epidemic influenza, bronchitis, and other affections of the air passages; and in making experiments at Basle, he found that, concurrently with the prevalence of

these disorders, ozone was very abundant in the air. On the other hand, it has been said that its deficiency in air will account for cholera or fevers, since the foul effluvia or miasmata giving rise to these diseases are not completely destroyed or removed by the oxidizing action of ozone. These of course, are mere speculations insusceptible of proof; but in the meantime, it, must be conceded that the subject opens a new road to experiment and observation, and that very important results may be obtained by following out Schönbein's researches.—*London Medical Gazette, June 20th,* 1851.

On the Siphonia, or India-Rubber Tree. By Richard Spruce, Esq.—The Seringue-tree has long been known to exist abundantly on the Rio Madeira, but it is only during the present year that it has been found to grow on the Ramos in considerable quantity.

After breakfast the Capitaô accompanied us into the forest, and showed us the Seringue-trees, and the mode of collecting the milk. A track had been cut to each tree, as also to adjacent flats of Urucurí palm (*Cocos coronata*, Mart.) which, curiously enough, is almost invariably found along with the Seringue, and whose fruit is considered essential to the proper preparation of India-rubber. A stout sipó is wound round the trunk of the Seringue, beginning at the base and extending upwards about as high as a man can reach, and making in this space two or three turns. This sipó supports a narrow channel made of clay, down which the milk flows as it issues from the wounded trunk, and is received into a small cuya deposited at the base. Early in the morning a man goes into the forest and visits in succession every tree, taking with him a terçado and a large cuya (called *cuyamboca*) suspended by a handle so as to form a sort of pail. With his terçado he makes sundry slight gashes in the bark of each tree, and returning to the same in about the space of an hour he finds a quantity of milk in the cuya at the base, which he transfers to his cuyamboca. The milk being collected and placed in a large shallow earthern-ware pan, several large caraipé-pots, with narrow mouths, are nearly filled with the fruit of the Urucurí and placed on brisk fires. The smoke arising from the heated Urucurí is very dense, and as each successive coat is applied to the mould (which is done by pouring the milk over it, and not by dipping it into the milk,) the operator holds it in the smoke, which hardens the milk in a few moments. The moulds now used are all of wood, and not of clay as formerly, and the one generally preferred is in the form of the battledores which English housewives use for folding linen, only thinner, and flat on both sides, and the milk is applied only as far as to the insertion of the handle, the latter being held by the operator. When the requisite number of coatings has been applied, and time has been allowed for the whole to stiffen, the seringue is withdrawn from the mould by slitting it along one side and end. In this state it is known in the Pará market as *Seringue em couro,* or hides of India-rubber, and it is preferred to the bottle-rubber by purchasers. I send you

one such "hide" from which you will see that Capitaô Pedro's manufacture is not despicable. If the bottle-moulds are used, or if a shoe is to be moulded on a last, a stick of two feet long is always inserted into the mould to guarantee the operator's hand from the milk and smoke. Some shoes we saw here had thirty coatings apiece of seringue. The Capitaô was getting about six milreis an arroba (32 lbs.) for his seringue, but in Pará it sells for as much as ten milreis. November is the season of ripe fruit of the seringue, but the trees on the Ramos had been completely stripped by the aráras, a sort of long-tailed parrot.—*London Pharm. Journ., from Hooker's Journal of Botany.*

On the Solution of Carbonate of Lime by Syrup of Lime.—M. Barreswill, in the course of some investigations on sugar, has ascertained that the compound of sugar and lime, sometimes called syrup of lime, has the property of dissolving carbonate of lime, as carbonate, and probably forms with it a double salt. This fact is interesting, and has considerable interest in connection with the extraction of sugars. It also accounts for the fact that syrup of lime is not rapidly rendered cloudy by exposure to the air by the precipitation of carbonate.—*Journ. de Pharm.*

Reagent for discovering Sugar in Animal Fluids.—A simple and easy means of discovering the presence of sugar in the blood, urine and bile, has been indicated by an English physician, Dr. Donaldson, viz.:

Take of Carbonate of soda, crystallized,	5	grammes.
Caustic potassa,	5	"
Bitartrate of potassa,	6	"
Sulphate of copper, crystallized,	4	"
Distilled water,	32	"

Boil and filter.

A few drops of this solution, thrown into urine or other liquid suspected of being saccharine, and heated over a spirit lamp, will discover the smallest quantity of sugar present. After a few minutes application of heat, the liquid acquires first a yellowish green color, and becomes more and more reddish yellow as the proportion of sugar is more considerable.—*Journ. de Chim. Med.*, Nov., 1851.

Persulphate of Iron a test for Gum.—M. Lassaigne states that *arabin* (pure gum arabic) dissolvedi n water, produces, with persulphate of iron added in small quantity, a *gelatinous yellowish* precipitate, *transparent as animal jelly.* Syrup of gum diluted with water gives the same reaction, whilst simple syrup is not affected. *Dextrine* is not precipitated by persulphate of iron, nor is starch and some other principles which are thrown down by subacetate of lead. Hence the ferruginous sesqui-sulphate taken in connection with subacetate of lead and alcohol, is a very good means of determining the presence of arabin, or soluble gum.—*Journ. de Pharm.*

Culture of Cinchona Bark in Algeria.—It has been stated that the Jesuit fathers of the house of Cusco in Peru intend sending to an agricultural colony under the direction of the Jesuits in Algeria, a number of plants of the Peruvian bark tree. The possibility of naturalizing this valuable tree on the sides of Mount Atlas, and at a height about that at which it grows on the Andes, at 1200 to 3200 metres (4000 to 10,000 feet) above the level of the sea, is yet very problematical, because it appears to have a particular predilection for the region of the Andes, the direction of which it follows without dispersing itself in other parts of tropical America.—*Journ. de Pharm.*

Cement for Stone Ware. By M. Heller.—Gelatine is allowed to swell in cold water, the jelly warmed, and so much recently-slacked lime added as is requisite to render the mass sufficiently thick for the purpose. A thin coating of this cement is spread while warm over the gently-heated surfaces of fracture of the articles, and let dry under a strong pressure. What oozes out is removed directly with a moist rag.—*Chem. Gaz., from Central-Blatt.*

On Gambogic Acid and the Gambogiates, and their use in Artistic Painting. By Dr. Scoffern.—The author described the composition of gamboge as a gum-resin, and stated that some years since he had proposed the use of a preparation of it for oil-painting. For this purpose he had employed methods to get rid of the gum. To obtain the gambogic acid, he recommended ether to be employed when the coloring matter is dissolved, and by distillation the ether is given off; the last portions however are retained with so much force that a temperature of 230° or 240° obtained, and this would destroy the color unless water was employed with the ether. About one-twentieth of water was previously added to the etherial solution of the pigment, or gambogic acid. The gambogiates of lime and other bases were under examination; the gambogiate of iron however produced a rich brown, like asphaltum, but capable of more richness and certainty in oil. From the trials made, the yellow and brown seemed to be permanent colors, having useful properties as oil-colors. He also thought they might be usefully employed in fresco.—*Ibid., from Athenæum.*

On a new Alkaloid from Opium. By F. Hinterberger.—The author purchased as narcotine a substance which contained very little of that principle, but consisted for the greater part of a new alkaloid, whose composition is represented by the formula $C^{66}\ H^{36}\ NO^{23}$. The author has named it *opianine.*—*Ibid., from Liebig's Annalen.*

On the Quantitative Estimation of Manganese. By Richard Laming, Esq. —I find, contrary to what is stated in works on chemical analysis, that carbonate of manganese is not decomposable at ordinary temperatures by the oxygen of the atmosphere, but remains perfectly white if it have been

precipitated without an excess of carbonate of potash or carbonate of soda. When the excess of either of these reagents is used in its precipitation, the excess of the alkali decomposes a portion of the metallic carbonate, and becomes a sesqui or a bicarbonate. If a bicarbonate of the alkali be used to precipitate carbonate of manganese, the precipitant may be added in excess, and the precipitate exposed to the air with impunity. Manganese resembles the magnesian class of metals in its carbonate being undecomposable by caustic ammonia; hence either of the carbonates of the volatile alkali may be used with effect to precipitate a carbonate of manganese that will remain persistent in the atmosphere. Carbonate of manganese, when exposed to any high temperature approaching near to redness, passes at once into the black oxide, without apparently going through any intermediate state of oxidation.—*Pharm. Jour., from Phil. Mag.*

On the Detection of Sulphur. By Mr. J. W. Bailey.—Dr. Playfair's beautiful salt, the nitroprusside of soda, is justly recommended by its discoverer as the most delicate of all tests for alkaline sulphides [sulphurets]. An application of it, which is very obvious, although not alluded to by Dr. Playfair, is to employ it not only as a direct test for alkaline sulphurets, but as an indirect one for sulphur in any of its compound. Any substance containing sulphur will yield an alkaline sulphuret if heated with carbonate of soda, either with or without the addition of carbonaceous matter, acording as a deoxidizing action is or is not required. The magnificent purple which is then produced by the addition of the fused mass to a drop of the solution of the nitroprusside will at once prove the presence of sulphur. This reaction is so easily obtained, and is so decisive, that the nitroprusside of soda must take its place among the most useful adjuncts of the blowpipe tests. By means of it, the presence of sulphur in the smallest particles of coagulated albumen, horn, nails, feathers, mustard seed, &c., which can be conveniently supported on a platinum wire for blowpipe experiment, may be most distinctly shown; and I have repeatedly obtained the characteristic purple tint in operating upon a piece of a single fibre of the human hair *less than an inch in length.*—*Silliman's Journal,* May, 1851.

Combinations of Sugar and Lime. By M. Peligot. [In a paper published in the *Journal de Pharmacie,* and republished in the Pharmaceutical Journal for July, 1851, the following table of the amount of lime taken into solution by syrup of various densities is found. M. Peligot infers from his experiments that the statement of Soubeiran, that the compound formed has a constant composition of $2\,C_{12}\,H_{11}\,O_{11}$, 3 CaO, is incorrect, and that the compound always formed at first, is $C_{12}\,H_{11}\,O_{11}$, CaO, which afterwards dissolves more or less of the base according to the density of the saccharine solution.—Ed.]

The following table shows, 1. The composition and the density of the

saccharine liquor; 2. Its density after having been saturated with lime; 3, The quantities of lime and of sugar contained in 100 parts of residue yielded by evaporation to dryness of each of these solutions. This residue was dried at 248° F. The densities were taken with the utmost accuracy by means of a specific gravity bottle:—

Sugar in 100 Parts Water.	Density of Saccharine Solution	Density of Liquid when saturated with Lime.	100 Parts of the Dry Residue contain	
			Of Lime.	Of Sugar.
40.	1.122	1.179	21.	79.
37.5	1.116	1.175	20.8	79.2
35.0	1.110	1.166	20.5	79.5
32.5	1.103	1.159	20.3	79.7
30.0	1.096	1.148	20.1	79.9
27.5	1.089	1.139	19.9	80.1
25.0	1.082	1.128	19.8	80.2
22.5	1.075	1.116	19.3	80.7
20.0	1.068	1.104	18.8	81.2
17.5	1.060	1.092	18.7	81.3
15.0	1 052	1.080	18.5	81.5
12.5	1.044	1,067	18.3	81.7
10.0	1.036	1.053	18.1	81.9
7.5	1.027	1.040	16.9	83.1
5.0	1.018	1.026	15.3	84.7
2.5	1.009	1.014	13.8	86.2

Formation of Sulphuric Ether by Chloride of Zinc.—Fused chloride of zinc is soluble in hot highly rectified spirit of wine, and if the solution of it be distilled, it gradually acquires the smell of sulphuric ether, and a specific weight of 0.796. The more concentrated this alcholic solution becomes, and the more the temperature increases by continued distillation, the more distinctly the formation of sulphuric ether takes place; and the cause of its generation is, that at a certain temperature the affinity of the chlorine in the chloride of zinc for the hydrogen, and of the zinc for the oxygen, of the spirit of wine, increases to such a degree, that decomposition takes place. We find, therefore, in the distillate, besides spirit of wine and ether, also a small quantity of muriatic acid, and in the residue free oxide of zinc. As chloride of zinc consists of one equivalent of chlorine and one equivalent of zinc, the alcohol must have lost hydrogen and oxygen in the same proportion as the latter form water; the ether must, therefore, necessarily be alcohol minus HO. This does, however, not prove that alcohol is a hydrate of ether, *i. e.*, that the water is contained in it ready formed as such; on the contrary, it can be shown that alcohol is a simple organic substance. Chloride of zinc, distilled with water, lets the water pass over without decomposition, neither muriatic acid nor oxide of zinc being generated. It is, therefore, clear, that, if oxygen and hydrogen are once com-

bined to form water, the affinity of the single constituents of chloride of zinc are unable to destroy this combination; and that, if the combinations are actually destroyed, as is the case in the present experiment, the oxygen and hydrogen cannot be united as water.

This experiment refutes the theory, according to which alcohol is said to be the hydrate of ether, and serves to corroborate the fact, that ether can in no way be changed again into alcohol by communicating water to it. If, therefore, alcohol does not contain ready-formed water, it cannot be changed into ether by mere water-abstracting power, but only by water-generating power. And with this all experiments agree. Chloride of calcium merely abstracts water, but does not generate ether, for its constituents have so strong an affinity for one another, that they cannot be separated by the simultaneous attraction of the oxygen and hydrogen contained in the alcohol. Chloride of tin, chloride of antimony, and chloride of iron act in a similar manner to the chloride of zinc, destroying alcohol and generating ether; as also fluoride of boron and fluoride of silicon, which substances do even decompose the water and generate hydrofluosilic acid and boracic or silicic acid. These facts speak strongly in favor of Dr. Mohr's theory of the generation of ether.—*Buchner's Repert. and Pharm. Journ.*

On the Datura Sanguinea. By M. Berthold Seemann, Naturalist of H. M. S. Herald.—The *Florispondio* (*Datura sanguinea*, Ruiz et Pav.) appears to have always played, and still continues to play, a prominent part in the superstition of tropical America. The Indians of Darien, as well as those of Choco, prepare from its seeds a decoction, which is given to their children to produce a state of excitement in which they are supposed to possess the power of discovering gold. In any place where the unhappy patients happen to fall down, digging is commenced; and, as the soil nearly everywhere abounds with gold-dust, an amount of more or less value is obtained. In order to counteract the bad effect of the poison, some sour *Chica de Maiz*, a beer made of Indian corn, is administered.—*Hooker's Journ. Botany, and Ibid.*

On the Palo de Velas or Candle-Tree. (*Parmentiera cereifera*, Seem.) By M. Berthold Seemann.—This tree is confined to the valley of the Chagres, where it forms entire forests. In entering them, a person might almost fancy himself transported into a chandler's shop. From all the stems and lower branches hang long cylindrical fruits, of a yellow wax-color, so much resembling a candle as to have given rise to the popular appellation. The fruit is generally from two to three, but not unfrequently four feet long, and an inch in diameter. The tree itself is about twenty-four feet high, with opposite, trifoliolated leaves and large white blossoms, which appear throughout the year, but are in greatest abundance during the rainy season. The *Palo de velas* belongs to the natural order *Crescentiaceæ*, and is a *Par-*

mentiera, of which genus, hitherto, only one species, the *P. edulis*, De Cand. was known to exist. The fruit of the latter, called *Quauhxilote*, is eaten by the Mexicans; while that of the former serves for food to numerous herds of cattle. Bullocks, especially, if fed with the fruit of this tree, Guinea grass, and *Batatilla* (*Ipomœa brachypoda*, Benth.) soon get fat. It is generally admitted, however, that the meat partakes in some degree of the peculiar apple-like smell of the fruit; but this is by no means disagreeable, and easily prevented if, for a few days previous to the killing of the animal, the food is changed. The tree produces its principal harvest during the dry season, when all the herbaceous vegetation is burned up; and on that account its cultivation in tropical countries is especially to be recommended; a few acres of it would effectually prevent that want of fodder, which is always most severely felt after the periodical rains have ceased.—*Hooker's Journ. of Botany, and Ibid.*

On the Growth of Plants in Various Gases, Especially substituting Carbonic Oxide, Hydrogen, and light Carburetted Hydrogen for the Nitrogen of the Air. By Messrs. Gladstones.—Dr. Gladstone gave the results of experiments made and still in progress, with his brother, Mr. G. Gladstone. After describing the effects on some flowers, as the pansy, the crocus, &c.—a discussion ensued—Mr. R. Warington suggesting that in such experiments the plants be allowed to take root well before immersing them in the gases; next, that the combined atmospheres were too much saturated with moisture, often causing rapid growth and decay; and that these flowers and roots should be compared with others grown in similar volumes of confined common air.—Prof. Dumas spoke of the great, and, indeed, almost unsuspected influence of carbonic oxide gas. The judicial investigations in France had disclosed the fatal effects of this gas as being so much greater than carbonic acid gas. In the atmosphere produced by the burning of charcoal, 1-200th part of carbonic oxide was fatal, while with one-third the volume of carbonic acid the animal was asphyxiated, but afterwards revived. The Chairman said that he had reason to believe that in the combustion of anthracite, much carbonic oxide gas is produced.—*Ibid, from Report of British Association in the Athenæum.*

Editorial Department.

PHARMACEUTICAL CONVENTION HELD IN NEW YORK, OCT. 15TH, 1851.—In our last number it was stated that a Convention of delegates from the Colleges of Pharmacy had been called by the New York College, to meet in New York, for the purpose of considering the propriety and practicability of fixing a set of standard strengths and qualities of drugs and chemicals for the government of the United States Drug Inspectors. For an account of what was accomplished by the Convention, our readers are referred to an article at page 22, which was taken partly from a notice in the Boston Medical and Surgical Journal, partly from the Minute Book of the Secretary, and partly from our recollection of the occasion.

PHARMACEUTICAL CONVENTION TO MEET IN PHILADELPHIA OCT. 6TH, 1852. The following is a circular letter addressed by President Guthrie, to the pharmaceutists of the United States, on behalf of the late Pharmaceutical Convention.

NATIONAL PHARMACEUTICAL CONVENTION.

CIRCULAR LETTER.

New York, November 25th, 1851.

SIR,—At a Meeting of Delegates from the Colleges of Pharmacy of the United States, held in this city, on the 15th of October, 1851, the following Preamble and Resolutions, explanatory of themselves, were offered, and, after a free and full discussion, unanimously adopted :

" *Whereas,* The advancement of the true interest of the great body of PHARMACEUTICAL PRACTITIONERS, in all sections of our country, is a subject worthy of earnest consideration ; and *Whereas,* Pharmaceutists, in their intercourse among themselves, with Physicians, and the public, should be governed by a Code of Ethics calculated to elevate the Standard, and improve the Practice of their Art ; and *Whereas,* the means of a regular Pharmaceutical Education should be offered to the rising Pharmaceutists by the establishment of SCHOOLS OF PHARMACY, in suitable locations ; and *Whereas,* it is greatly to be desired that the united action of the Profession should be directed to the accomplishment of these objects ; THEREFORE

Resolved, That, in the opinion of this Convention, much good will result from a more extended intercourse between the Pharmaceutists of the several sections of the Union, by which their customs and practice may be assimilated ; that Pharmaceutists would promote their individual interests and advance their Professional standing by forming Associations for mutual protection, and for the education of their Assistants, when such Associations have become sufficiently matured ; and that, in view of these important ends, it is further

Resolved, That a Convention be called, consisting of three Delegates each from incorporated and unincorporated Pharmaceutical Societies, to meet at Philadelphia, on the FIRST WEDNESDAY IN OCTOBER, 1852, when all the important questions, bearing on the Profession, may be considered, and measures adopted for the organization of a NATIONAL ASSOCIATION, to meet every year."

The objects set forth in the above, I trust, will meet the hearty approbation of yourself and the Apothecaries of your place, and lead to the formation (if not already in existence) of such an Association as will coöperate in the furtherance of the proposed Association.

Our Medical brethren have, as you doubtless are aware, an organization, similar in character, holding its sessions annually, in which all matters pertaining to their Profession are fully discussed,—the beneficial effects of which are already apparent, though the Association has been in existence but a few years.

They cannot give to the subject of Pharmacy the attention it requires and deserves, neither is it a matter legitimately falling under their cognizance, but belongs to Pharmaceutists themselves.

The Medical Profession and the Community at large rightfully look to us for the correction of any existing abuses, the advancement of the Science, and the elevation of the business of an Apothecary, to the dignity and standing of a Profession.

To this end we invite you to the formation of such Associations, in view of the Convention, to be held in Philadelphia, on the first Wednesday of October, 1852.

Communications, intended for said Convention, may be addressed to WILLIAM PROCTER, JR., Philadelphia, GEORGE D. COGGESHALL, New York, or S. M. COLCORD, Boston.

Any communication, touching the subject of the above letter will be cheerfully responded to by the President of the Convention.

C. B. GUTHRIE,
President Convention Colleges of Pharmacy.

When the invitation to the Convention from which the above resolutions emanate, was received by the Philadelphia College of Pharmacy, several of the members expressed the opinion, that although the call was for a special object, the Convention might take a wider range in its influence, and form a *point d'appui* from which the pharmaceutical profession of the whole country might be reached, and a course of action instituted, which eventually would revolutionize the condition of Pharmacy in the United States. The most sanguine hopes of these members were gratified by the unanimous adoption of the above preamble and resolutions, by the Convention.

We feel a lively faith that ultimate and lasting good will result from this movement: We cannot repress the expression of a deep gratification at the prospects which open out in the future favorable to the real progress and elevation of our Profession, both in its practical and scientific relations, over our favored country, wherever the apothecary has located, or is locating. It will necessarily be a work of time, and calls for the faith, the energy, and the untiring perseverance of its supporters. But is not the object

worthy of its advocates and their best exertions? That object is no less than a complete organization of the large, but to a great extent ill educated body of Pharmaceutists of the United States, which will induce the existing members to pursue an efficient course of *self education*, and dispose them to extend to their protégés and assistants a more liberal tuition in the sciences accessory to our Art.

Perhaps in no country in the world is the proportion of apothecaries to population greater than in our own. In no country is their practice so little interfered with by legislative enactments or so little fostered by the government. Left to themselves to pursue what course they may choose it is only when some of them by ignorance or carelessness have harmed the community, that common law steps in and deals with them as with other offenders against the well being of society; whilst no legal inducement is held forth for their improvement or encouragement.

In view of these facts what a noble field is open for pharmaceutical reform! A strong interest has already been awakened far and wide; from many a distant city and secluded town has the voice of inquiry gone forth seeking for the means of self improvement; and whether this interest arises from pecuniary or higher motives, it indicates that the blossoming time is approaching; that the fruit yet in embryo will soon be forming, and that on wise treatment and careful culture will depend the abundance, and the quality of the harvest.

We would then, with all the earnestness of our nature, invite the serious attention of our brethren, every where, to the Resolutions of the Convention; we ask them to throw aside local jealousies, and sectional feelings, and as the basis of a national Pharmaceutical reform, to found local societies for mutual improvement. Let every town and every city have its society. It is *in* these and *by* these that real good is to be promoted, for charity begins at home. *They* are in fact the only sure foundation upon which to base a state or national association; for however eloquent and persuasive the language of Conventions, when addressed to individuals, and however wise and useful the precepts they inculcate,—like the seeds, sown by the husbandman, they will perish or yield but a scanty and impoverished return, if the soil of local influence and interest be not prepared for their reception at the outset, and carefully tended by the hand of culture during progress in germination, growth, and fruition.

Fewness of numbers should not deter pharmaceutists from associating. A dozen well disposed men can accomplish wonders when enlisted in a common cause, and animated by a single interest. The Pharmaceutical Society of Great Britain, now numbering more than twenty-five hundred members in all parts of England, and in Scotland, had its birth at a tea-party given in London by a prominent chemist and druggist. A small number may not be adequate to establish a School, or desire to seek an act of

incorporation, but if not sufficiently numerous or advanced to teach others, they are sufficiently so to learn themselves. And how, it may be asked can it be done? We answer, by adopting a constitution and by-laws; by establishing monthly or more frequent meetings for inquiry and discussion on subjects appertaining to their business, or concerning their future advancement; by adopting a code of ethics regulating the intercourse and conduct of the members in their professional relations; and finally by subscribing to scientific Journals and standard works for circulation among themselves, so as to form the nucleus of a library. Every association of this kind is entitled to send three representatives to the Convention of 1852; for the far-seeing language of the Resolutions is "from incorporated and *unincorporated* pharmaceutical societies."

As a member of the Committee for receiving, collecting and communicating information and suggestions bearing on the Convention, we will cheerfully communicate with parties desiring information, or who may wish to have their views thrown before the Convention when it meets.

In regard to the utility of the proposed Convention itself, we have no fears, provided it is based on a wide spread representation—provided it is composed of earnest and sensible men, who aim at *the possible,* and fear not to grapple with that which keeps them from its possession. Before the continued voice of such a gathering, quackery, whether *professional* or *vulgar* would quail—would shrink into the hands of men quackish by nature, and the profession, washed of its contamination, could with clean hands and clear accents raise their voices against it with an effect, on all but the hopelessly ignorant, that would cripple the most fruitful sources of its present success.

New Lebanon; its Physic Gardens, and their Products.—In the last number, in speaking of the establishment of the Messrs. Tilden, we promised a further communication on the same subject, but in its relations to the United Society or people called "Shakers," residing in the same valley. During our short visit we received a hearty welcome from Mr. Edward Fowler and his friends, that caused us to regret our inability to accept their kindly offered hospitality, and to examine more closely than the time permitted, their gardens and their arrangements for drying and packing herbs and for making extracts.

The chief tract of land occupied by the "Society" lies on the right hand side of the valley, in approaching the village of New Lebanon, the residences, factories and public buildings of the Society occupying a plateau elevated perhaps two hundred feet above the high road. As their policy is directly cumulative, their lands occupy a large portion of the most valuable soil of the neighborhood, and many excellent lots and fields in the village and other parts of the valley, amounting, if we rightly remember, to near seven thousand acres. This large extent is by no means devoted to medicinal

plants, the culture of these forming but one branch of the operations of this industrious people, whilst agriculture and several manufactures are equally carried on. "It is about fifty years," says Mr. Fowler, "since our Society first originated as a trade in this country the business of cultivating and preparing medicinal plants for the supply and convenience of apothecaries and druggists, and for about twenty years conducted it on a limited scale. Some thirty years since Drs. E. Harlow and G. K. Laurence, of our Society, the latter an excellent botanist, gave their attention to the business, and induced a more systematic arrangement, and scientific manner of conducting it, especially as to the seasons for collection, varieties, and method of preparation. Since their time, the business has rapidly increased, and especially so within the last ten years. We believe the quantity of botanical remedies used in this country, particularly of indigenous plants, has doubled in less than that time."

"There are now probably occupied as physic gardens in the different branches of our Society, nearly two hundred acres,* of which, about fifty are at our village. As we find a variety of soils are necessary to the perfect production of the different plants, we have taken advantage of our farms and distributed our gardens accordingly. Hyoscyamus, belladonna, taraxacum, aconite, poppies, lettuce, sage, summer savory, marjorum, dock, burdock, valerian, and horehound, occupy a large portion of the ground; and about fifty minor varieties are cultivated in addition, as rue, borage, carduus, hyssop, marsh-mallow, feverfew, pennyroyal, &c. Of indigenous plants we collect about two hundred varieties, and purchase from the South, and West, and from Europe, some thirty or forty others, many of which are not recognised in the Pharmacopœia, or the dispensatories, but which are called for in domestic practice and abundantly used."

The drying and storing of so many plants requires much space, and several buildings are occupied wholly or in part for this purpose; the principal and central one of which is a neat structure about 120 feet long by 38 feet wide, two stories high with a well lighted basement and airy garret. The basement is devoted to the pressing, grinding and other heavy work, whilst at one end the steam boiler is placed. The first story is used for packing, papering, sorting, printing, and storing the products, whilst the second story and loft are used exclusively for drying and storing. Being well lighted and airy, these rooms are well fitted for the purpose. Racks of hurdles are conveniently arranged along the centre on which the herbs previously garbled are placed to dry, which is rapidly accomplished by the free circulation of air that is maintained throughout. The sides of the second story room are arranged with large and tight bins, in which the plants are put as soon as they are properly desiccated, until removed for pressing.

Some plants which are very succulent, or viscid, and which are difficult to properly cure, as conium, hyoscyamus, and garden celendine, are desiccated

* This number probably includes the settlements of Shakers, in New Hampshire, Ohio, and Western New York.

in a drying room, constructed for the purpose where a temperature of about 115° Fahr. is maintained. Most of the roots are dried in this way, after being sliced.

The Society have three double presses in constant operation, and occasionally use two others. Each of these is capable of pressing 100 lbs. daily, although of some kinds of material which require but little time "to set," three times this quantity can be packed.

We were shown into the evaporating room where the vacuum apparatus is stationed. This consists of a globular copper vessel supported on cast iron columns attached to the floor, about the size of an ordinary sugar vacuum pan. The bottom is jacketted for applying steam heat, whilst there is an interior false top extending from the sides up nearly to the manhole at top, which prevents the vapor which may condense on the interior of the proper top from falling back into the bowl of the evaporator. They at present, have no steam engine, but use a peculiar arrangement for exhausting the air from the pan, which consists in attaching the condensing vessel to a vertical tube 30 or 40 feet high, in which a column of water is constantly and rapidly descending, the effect of which is to produce a constant suction, of sufficient force to keep the evaporater sufficiently exhausted. As the apparatus was not in operation during our visit, we had no opportunity of observing the condition of the barometer guage. The water used for this purpose is derived from a small dam fed by mountain springs in the higher portion of their demesne.

In our last communication we stated, what we believed to be true, that the "Society" had adopted the vacuum pan in their extract manufacture to compete with their neighbors Messrs. Tilden, who, we believe, preceded them in its employment, not intending to infer that they would not have adopted it, had the idea been suggested in any other way, as appears to have been understood by Mr. Fowler and his friends, who feel themselves called upon to "deny the insinuation that *no other* motive was sufficient to induce the improvement; as not a member of our community had the least knowledge that medical extracts had ever been manufactured in America by that process at the time our apparatus was built. We knew that the imported extracts were generally esteemed as superior to many if not all the American, and feeling desirous of having our articles *right*, we adopted the vacuum pan as a necessary item by the recommendation of several members of the New York College of Pharmacy, whom we consulted on the occasion."

Mr. Fowler informs us that the amount of extracts manufactured at their establishment annually was about six or eight thousand pounds, but since their improvements in apparatus and manipulations, this amount has been greatly increased, and the quality improved. Extract of taraxacum is in the greatest demand, their product in this article amounting the past year to 3700 pounds. Conium, hyoscyamus, and belladonna class next. They do not cultivate conium, but collect that of spontaneous growth, believing it to be more active. Belladonna and hyoscyamus, especially the latter, re-

quires a rich deep soil and abundance of strong animal manure. They find henbane a very precarious crop, as when young it is almost impossible to keep it from being destroyed by insects, and some years they have entirely lost it, notwithstanding their best endeavors to protect it. The biennial variety of henbane is alone cultivated, and when not destroyed by insects, etc., has under the most favorable circumstances yielded at the rate of 1300 pounds of good extract from an acre of plants.

Some inquiries relative to the consumption of such large quantities of extracts, induce us to believe that by far the larger portion of them are used in the preparation of secret medicines. An agency in this city sold as much as 1200 pounds of extract of dandelion to one quack medicine vender, doubtless the proprietor of some extraordinary anti-dyspeptic elixir, or liver pills.

New York Journal of Pharmacy.—We are informed by a prominent member of the New York College of Pharmacy, that a Pharmaceutical Journal is about to be published under the auspices of that Institution with the above caption. It is to be issued monthly, each number to contain 32 pages, and to be Edited by Dr. Benjamin W. McCready, the Professor of Materia Medica and Pharmacy in the New York College of Pharmacy.

As an indication of the progress of Pharmacy, and especially as intimating a revival of scientific interest among our brethren in New York, we would welcome the "New York Journal of Pharmacy" as a younger sister, instituted for the same object—destined, we hope, for a successful career. We will cheerfully join hands with her in the dissemination of pharmaceutic knowledge; in the advocation of a correct system of pharmaceutical ethics; and in the pursuit of measures calculated to elevate our profession, and rid its ranks of the numerous pretenders which the absence of legal restraint, and the want of a just discrimination in the public patronage, have admitted and encouraged.

In the midst of the most numerous community in the country, possessed of means of intercommunication with all the world exceeding every other American city, the New York Journal will commence its course under favorable auspices, and if she only succeeds in arousing the apathy of the New York Pharmaceutists, and in enlisting their talents in the cause of science, she will merit the respectful consideration of the whole profession.

Outlines of Chemistry for the use of Students. By William Gregory, M. D., Professor of Chemistry in the University of Edinburgh. *First American from the second London Edition,* by J. Milton Sanders, M. D., L.L. D., Professor of Chemistry, &c., Cincinnati. H. W. Derby & Co., publishers.

The work of Dr. Gregory, contrary to what has been usual with modern works on chemistry from the British press, has not been republished here until several years after its issue in London. Although well known to many

American chemical students in its English garb, a large number of persons whose business or taste incline them to chemical pursuits, have not met with the work. It has been looked upon as one of the most comprehensive treatises of the modern school of organic chemistry accessible to the English student, and appearing as it now does with the notes of an American Editor, it should be increased in value.

The most striking peculiarity of Dr. Gregory's book, is the omission of any connected account of the imponderables, *heat, light, electricity* and *magnetism*. The author considering these subjects as appertaining more properly to a course on physics, which should be included in the preliminary studies of the student, has omitted them chiefly because the time devoted to an ordinary course of lectures in medical institutions is too brief to enable the lecturer to illustrate them properly.

Whilst admitting the force of this reasoning as applied to students properly *pre*-educated, we think it very different when considered in relation to a large number of the candidates for the diploma in this country, whose preliminary education in science has been far too meagre to properly fit them for practitioners. To such, the important bearing which electricity and heat especially, have in chemistry and medical science, renders their elucidation in connection with the course on chemistry, a matter of no small importance.

The first forty pages are devoted to an explanation of the laws of affinity combination, definite proportion, isomorphism, isomerism, etc. The metalloids are then treated of, followed by the metals and their binary compounds, the theory of the constitution of salts, and a condensed description of the salts themselves.

The organic part, which is treated in much more detail than the inorganic division, is evidently that portion of the work in which the author feels the strongest interest himself, and which he believes should most forcibly attract the medical student, from its connection with physiology, toxicology, etc. A pretty full account is given of the doctrines of radicals, types, and substiutions, of oxidation, and fermentative metamorphoses, in the first thirty pages. The radicals and their derivatives, commencing with amidogen, occupy a large portion of the remainder of the book, and present these subjects, elaborate as they are, in as clear a view, as their abstruseness will perhaps admit. The organic acids and alkalies, coloring substances, and neutral principles, are followed by the pyrogenous products of organic bodies, and a general notice of animal chemistry, which concludes the work.

As a text book for the purely *chemical* student, Dr. Gregory's treatise ranks deservedly high. We do not know how far the British medical universities and colleges are enabled to imbue their pupils with the fundamental doctrinesof organic chemistry, as set forth in the work before us, and acquaint them with details; but it appears to us that this important branch of chemical science needs some master hand to simplify its arrangements, with a view to the wants of the medical student, by which he can escape

from the labyrinth of theories, and keep within the range of the more important facts. It cannot be expected that he shall become a *chemist* by listening to the lectures, and witnessing the few experiments of two medical courses; and the home study which he should give to the subject, should be assisted by a text book of the most simplified and lucid character. The book of Professor Gregory, therefore, whilst it bears on its face the most undoubted evidence of the ability and talent of its author, is in our opinion not as well fitted for a text book for medical students, as are less elaborate works.

The duty of an editor in revising a book should be to bring it up to the level of the progress of discovery at the time of issue—and as four years have elapsed since the last foreign edition was published, we naturally look for additions, which are not to be found in the foot notes of the editor, nor in the text, and several of which are important.

In looking over the notes, at page 75, the mode of accounting for the greater solubility of *caustic* lime in cold than in hot water, by attributing it to carbonic acid present in the former liquid, is certainly novel!

Again, we perceive at pages 426 and 430, notices of certain compounds of citric and tartaric acid with sesquioxide of iron, and the bases quinia, morphia and *salicin* (!) so as to form double salts. Professor Sanders says, salicin is a weak base, but will, under favorable circumstances, form salts with acids, and acid radicals. At page 363 in the text, salicin is called a neutral body, and is analogous to sugar. We presume that sugar, starch or gum, have equal claims to basic power, and a *ferrotartrate of arabin* might be made. In fact the amorphous character of the salts of citric and tartaric acids with sesquioxide of iron alone or shared with other bases, gives ample opportunity to associate any soluble compatible body with those acids, which may then be saturated with sesquioxide of iron, and evaporated on glass to obtain the mixture in scales. The ferrotartrates and citrates of iron with quinia and morphia are recommended to be made by adding the pure alkalies to a saturated solution of citric and tartaric acids, and neutralizing the solution with hydrated sesquioxide of iron. As no chemical formulæ are given for these compounds, we naturally ask how much morphia? how much quinia? In a work of acknowledged accuracy, it is to be regretted that such loose statements should gain admission. The note at page 474 on *Resinoids*, both as regards the discovery and the nature of these principles, is inaccurate, and we think, notwithstanding the opinion of its writer, that a long time will elapse ere "active principles analogous to the alkaloids in nux vomica, opium, &c.," will be found in these so called *resinoids*. In almost every instance yet investigated, natural vegetable alkalies exist in combination with an excess of acids, so as to be soluble in water. Narcotin is partially an exception. The best known of the substances in question, podophyllin, was first isolated in a state of purity by Mr. John R. Lewis (see Am. Jour. Pharm., xix, page 165,) and shown to be a resin like that of jalap.

We have not had time to examine closely the typographical correctness of the very numerous and complex formulæ, in the organic department of the work—but as far as we have done it they appear correct. Apart from the points noticed, the book is very creditable to the editor and publisher, to both of whom we would express our thanks for so valuable an accession to our chemical literature.

The Elements of Materia Medica and Therapeutics. By JONATHAN PEREIRA, M. D., F. R S., and L. S. *Third American Edition, enlarged and improved by the author. Including notices of most of the medicinal substances in use in the civilized world, and forming an encyclopædia of Materia Medica.* Vol. I. Edited by JOSEPH CARSON, M. D., Professor of Materia Medica and Pharmacy in the University of Pennsylvania, &c. Philadelphia, Blanchard & Lea, 1852.

The first volume of the third edition of Dr. Pereira's Elements of Materia Medica, was published in London in 1849. Since that period the second volume has been slowly evolving from the press, and will not be completed until towards the middle of the year 1852. In view of this delay, Messrs. Blanchard & Lea determined to publish the first volume separately, which has been accomplished in the book before us. The publishers, in order to render the work in the highest degree worthy of the confidence of the American reader, secured the services of Dr. Pereira to revise, enlarge, and prepare it for the American press; an arrangement specially useful, as, since the English edition was issued, two of the British pharmacopœias have been revised, rendering many changes in the details of the work necessary. This, like the former American editions, has been brought out under the supervision of Professor Carson, who, besides introducing the formula of the new United States Pharmacopœia, has added "notices of articles and information on topics which more especially interest American Physicians." The second volume which is now in press, we are informed, will be ready about July or August 1852.

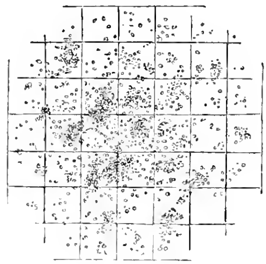
In looking over the volume in hand, we were first struck with its improved typography, and more numerous illustrations, and afterwards by the great increase of matter, which amounts to 124 pages more than the first edition. The additions and improvements are very numerous and thorough, and extend into every subject on which, in the progress of observation, new light has been thrown. To attempt a review, embracing even a tythe of the additions, would occupy more space than we could offer, nor shall we attempt it; but to give an idea of the close scrutiny to which the materia medica has been subjected by our indefatigable author, we will give a short quotation, with illustrations:

"*Common Calcined Magnesia.* (*Magnesia Calcinata.*)—This is a much lighter preparation than the so called, heavy calcined magnesia. All the samples which I have met with are contaminated with the carbonate, and

effervesce when mixed with water and acetic acid. When moistened and examined by the microscope in day light, it appears of a pale yellow color and is found to consist of a flocculent or minutely granular substance intermixed with fragments of prysmatic crystals (similar to those found in the light carbonate of magnesia.) See figure 1.

Figure 1.

Figure 2.



" *Heavy Calcined Magnesia.* (*Magnesia Calcinata ponderosa.*) This is sometimes called *condensed calcined magnesia.* It is a harder, firmer, purer, and heavier preparation than the preceding. None of the commercial samples which I have examined contain so much carbonate as the common calcined magnesia, and do not therefore effervesce so freely when mixed with water and acetic acid. Some of the samples which I have met with, are, to the naked eye, quite pulvernlent: others are composed of little lumps or masses formed by the cohesion of the powder, and which have sufficient hardness to produce a ringing sound when shaken in a glass bottle. On the label of one specimen of this kind which I have met with, it is stated that one part in bulk is equal to three parts of the common calcined magnesia. When moistened and examined by daylight with the microscope, Howard's heavy calcined magnesia is seen to consist entirely of yellow minute granules, more or less cohering into small masses: no fragments of crystals were perceptible in it. (See Fig. 2.) The same I found to be the appearance of other commercial samples of heavy calcined magnesia, as well as of *Henry's Calcined Magnesia.*"

The application of the microscope, in discovering the characters, and in ascertaining the genuineness of drugs, etc., has been extensively brought to his assistance by our author.

The numerous and valuable improvements in the first volume or inorganic part, in which, usually, changes are less apt to be needed, lead us to anticipate a great accession of interesting subjects in the second volume on organic drugs. We have reason for believing, from the numerous contributions of Dr. Pereira to the Pharmaceutical Journal, that he has subjected the work to a most thorough examination, and the interesting contributions from the East, South America, and the Indies, which were attracted to London by the World's Exhibition, will doubtless be made use of when their interest or value demands it. Besides, it will be in the second volume more especially that the additions from the pen of Dr. Carson will appear. When completed, therefore, this work of Dr. Pereira will be beyond all

question the most comprehensive treatise in the English language on Materia Medica and Therapeutics, and especially valuable to investigators by its numerous references to authorities. For these reasons we would advise every physician who is desirous of posting himself up on the important subjects treated, to own it, and every pharmaceutist who aims at a thorough acquaintance with materia medica, should possess the work, if it is only for the benefit of his assistants in pursuing their studies.

The Physician's Visiting List, Diary, and book of Engagements for 1852. Philadelphia, Lindsay & Blakiston.

The usefulness of this little book to the practitioner will hardly be questioned. To those physicians whose habits are systematic, it will be familiar, and perhaps present arrangements analogous to those they are daily using; and to those others, and they are numerous, who lack system in their daily routine of duties, this book, *if followed*, will lead to the formation and fixing of useful habits, not the least important of which is the economy of time. The almanac, and the short hints in reference to doses, antidotes, professional ethics, etc., embraced in the preliminary pages, may often assist memory at a moment of need.

A Compilation of Latin Labels, *from the revised edition of the United States Pharmacopœia and other standard authorities; published by authority and under direction of the Philadelphia College of Pharmacy. Sixth Edition.* Philadelphia, 1852.

We are gratified in being able to state that the sixth edition of the book of Latin Labels for shop furniture has been published, after some unavoidable delay. A very decided improvement has been effected by the Committee having it in charge, by putting each kind of label together, and by placing them in uniform columns and in alphabetical order. The curved labels have been much increased by occupying the space of the specimen labels attached to the last edition, which have been omitted in this, the Committee having determined hereafter to print the specimen labels of all kinds in a separate book.

Druggists wishing to be supplied with these labels from the College, should apply to Charles Ellis, No. 56 Chestnut street, Philadelphia, who is Chairman of the Label Committee.

Class of the Philadelphia School of Pharmacy, Session 1851–2.—We annex a list of the students in attendance at the Philadelphia School of Pharmacy the present session, and are pleased to notice that it is larger than that of the last session.

A CATALOGUE OF THE STUDENTS

CONSTITUTING THE CLASS OF THE

PHILADELPHIA COLLEGE OF PHARMACY,

For the Session of 1851-2.

Agnew, Henry	Philadelphia,	Pennsylvania.
Alexander, Maurice W.	"	"
Bachman, Alexander	"	"
Baker, Charles	"	"
Baker, T. Roberts,	Richmond,	Virginia.
Balliet, Louis	Lehigh Co.	Pennsylvania
Barclay, James S.		Kentucky.
Beck, Abraham R.	Litiz,	Pennsylvania.
Bispham, J. L.	Philadelphia,	"
Bonsall, Charles T.	Trenton,	New Jersey.
Bower, Henry	Morrisville,	Pennsylvania.
Buck, Charles E.	Philadelphia,	"
Burton, David F.	Dover,	Delaware.
Caldwell, Jr., Samuel W.	Philadelphia,	Pennsylvania.
Cañedo, Cipriano	"	"
Conyers, James R.	"	"
Corbett, John	"	"
Davis, John L.	"	"
Detwiller, John J.	Northampton,	"
Dieffenbacher, Calvin O.		"
Downs, Michael J.	Philadelphia,	"
Doret, Augustus M.	New York,	New York.
Douty, Henry P.	Philadelphia,	Pennsylvania.
Edwards, Wm. H.	"	"
Eggert, Charles H.	Bethlehem,	"
Emanuel, Louis M.	Delaware Co,	"
Evans, Lemuel L.	Montgomeryville,	"
Farr, James M.	Philadelphia,	"
Franks, Edward G.	Lewistown,	"
Gahan, Edward J.	Dublin,	Ireland.
Gaillard, E.	Philadelphia,	Pennsylvania.
Gormly, George M.		Virginia,
Griffith, William H.	Philadelphia,	Pennsylvania.
Gutekunst, Frederick	Germantown,	"
Hance, Edward	Philadelphia,	"
Harper, David	Shippensburg,	"
Harres, J. Henry	Philadelphia,	"
Hartman, Wm. B.	Malaga,	New Jersey.
Hendel, Samuel D.	Philadelphia,	Pennsylvanis.
Herndon, James	Winchester,	Kentucky,
Heyser, William	Chambersburg,	Pennsylvania.
Holden, John	Frankford,	"
Hooper, John H.	Cambridge,	Maryland,
Humburg, William G.	Philadelphia,	Pennsylvania.
Humphreys, Jesse B.	Montgomery,	"
Jenks, J. Ridgeway,	Bucks Co.	"

Jones, Alfred	Philadelphia,	Pennsylvania.
Jones, Tobias W.	"	"
Jones, William		Ireland.
Kerlin, Frederick E.	Chester,	Pennsylvania.
Leuchsening, Herman	Havana,	Cuba.
Mansfield, Michael	Philadelphia.	Pennsylvanie.
Mitchell, Alexander	"	"
Moore, Robert	Baltimore,	Maryland.
Morgan, David U.	Philadelphia,	Pennsylvania.
Morris, J. H. M.,	Louisville,	Kentucky.
Ogden, Edward H.	Philadelphia,	Pennsylvania.
Patterson, William M.	"	"
Peltz, Richard	"	"
Perot, Joseph S.	"	"
Rittenhouse, Henry N.	"	"
Ritter, Bradford	"	"
Rogers, Charles S.	Norfolk,	Virginia.
Ruch, John H.	Pottsville,	Pennsylvania.
Savery, Jr., William	Philadelphia,	"
Selfridge, Matthew M.	Allentown,	"
Sharswood, J.	Philadelphia,	"
Sheaff, John F.	Delaware Co.,	"
Shinn, James T.	Philadelphia,	"
Shrom, Charles F.	Carlisle,	"
Smith, Mahlon K.	Salfordville,	"
Southall, Turner H.	Norfolk,	Virginia.
Stackhouse, David L.	Bucks Co.,	Pennsylvania.
Stevens, Hennell	Philadelphia,	"
Stoeckel, George W.	"	"
Thomas, Jesse J.	Beverly,	Rhode Island.
Thompson, Wm. B.	Philadelphia,	Pennsylvania.
Thompson, Wm. H.	"	"
Tomlinson, E.	"	"
Uhler, Jonathan K.	"	"
Verner, Chittick		Ireland.
Walker, Wm. H.	Waynesboro,	Pennsylvania.
Walters, Joseph P.	Philadelphia,	"
Watson, William S.	"	"
Willitts, Charles J.	Burlington,	New Jersey.
Wolff, Wm. H.	Philadelphia,	Pennsylvania.
Ziegler, Henry S.	Salfordville,	"

THE

AMERICAN JOURNAL OF PHARMACY

APRIL, 1852.

AN ANALYSIS OF ERGOT OF RYE.

(*Being an Inaugural Thesis presented to the Philadelphia College of Pharmacy.*)

By T. Roberts Baker, of Richmond, Virginia.

In selecting Ergot as the subject of my thesis, it was with no intention of entering into an account of the natural, botanical, or commercial history of the article, which would be a mere repetition of what is contained in every standard work on Materia Medica ; but with a view of adding a few more links to the chain of scientific information already acquired in relation to its chemical constitution.

By thus lifting a little higher the veil of obscurity which has so long impeded the claims of Ergot as an eligible therapeutical agent, and bringing some of its hidden properties within the grasp of the practical pharmaceutist, it may become entitled to a higher rank in therapeutical Materia Medica. Some of the most prominent questions which remain to be definitely settled in regard to Ergot are these :

1. As to its origin, whether it is an excrescence produced by an insect, or a true member of the fungus tribe ?

2. Whether it contains one or more characteristic principles in which the active medicinal properties reside ?

3. How such a principle can be isolated ?

4. What are the general properties of various constituents of Ergot?

These are some of the questions which depend chiefly upon chemical examination for their settlement, and which, with many others of importance, I hoped the results of the investigation I have made would have answered satisfactorily.

My investigation has been purely a chemical one, and I regret that, owing to circumstances beyond my control, the therapeutical application of the subject, although previously contemplated, was abandoned.

Analysis of Secale Cornutum, or Ergot.

Having procured a superior article of Ergot of German origin, I submitted it to proximate organic analysis by successive displacement with water, alcohol, and ether, and made a mineral analysis of its ashes. After repeated qualitative examinations as to the best method of treatment, I adopted the course indicated above as most free from objections. For where ether is first employed upon the ergot, portions of resin are extracted, rendering it difficult to obtain the oil in a state of purity; and if alcohol be first used, the extracted resin carries with it portions of oil and other mattei which also hinder purification. The investigation was conducted in the laboratory of Professor Booth, to whom I am indebted for advice during the progress of my operations.

1. *Displacement by Water.*—The finely powdered ergot mixed with an equal bulk of pure sand, was treated with water in a displacement apparatus until the solution passing through was colorless.

The solution was dark brown, had an ergot odor, a sweetish but nauseous taste, and tested acid. It contained gum, sugar, albumen, one of the colored resins, nitrogenous extractive, and the soluble salts. After being somewhat concentrated by evaporation, a coagulated substance that appeared in it was separated by repose, decantation and washing. The precipitate agreed with albumen in its behaviour, giving off a large amount of ammonia when heated with potassa-lime, but did not show the blue color with muriatic acid in consequence of its dark brown color.

The solution and washings were evaporated to a syrupy consistence and treated with alcohol of 80°, which gave a viscid precipi-

tate in a clear brownish solution. After decantation, the viscid mass was softened with a little water and again treated with alcohol both cold and hot; and this operation repeated a third time. The precipitate thus freed from all that was soluble in alcohol was dried as far as practicable and weighed. The precipitate had a taste similar to that of gum, and consisted chiefly of gum and nitrogenous matter. It was soluble with a brownish red color in water, the alkalies, the acids, and in alcohol of 20°, but insoluble in ether and strong alcohol; its solution was precipitated entirely by acetate of lead and corrosive sublimate, and less perfectly by subacetate of lead and tannin; it was not altered by yellow prussiate of potash. It was charred by oil of vitriol; but by boiling with diluted sulphuric acid was partly changed into sugar. Heated with potassa-lime it gave off ammoniacal fumes.

The hot alcoholic solutions, by repose, deposited small four-sided prisms upon the sides of the glass, which agreed in form and behaviour with mushroom sugar; but as its amount was small, it was not deemed of sufficient importance to justify the analysis of a fresh portion of ergot with a view of determining its quality.

The alcoholic solutions thrown together, were evaporated to a soft extract, which could not be further hardened without decomposition. This is the ergotin of Bonjean, and contains the greater part of the nitrogenous extractive, together with a little resin. It is soluble in water, alcohol, the strong and dilute acids, and in the alkalies with a dark red color, which is deeper with the latter, and with sulphuric acid; its solution is precipitated by the acetates of lead, corrosive sublimate, and tannin, but not by yellow prussiate of potash; it evolves copious fumes of ammonia when treated with potassa-lime. Its behavior to reagents and its peculiar meat-like odor, recall the characteristics of osmazone.

2. *Displacement with Alcohol.*—After thorough displacement with water, the residue was similarly treated with alcohol of 80° until the latter passed through colorless.

The tinctures evaporated by water bath and dry hot air, became a mass of hard black crusts forming a net-work through a black oily liquid.

As the alcoholic solution tested acid, it was inferred to contain resin. The liquid being poured off, the residue was repeatedly

treated with hot alcohol, and the remaining hard resin weighed. The alcoholic solutions being reduced in bulk, formed a clear brown solution above the black oil; and were separated by decantation, and washing the oil with alcohol, hot and cold, until it ceased to give color. The tinctures upon evaporation gave a soft brownish-black resin. The alcoholic displacement therefore yielded a black oil and a soft and a hard resin.

The black oil yielded a slightly brown color to the acid, and alcohol, was insoluble in water, and perfectly soluble in ether with a brown color and acid test. It was saponified by potassa, and converted by chloride of calcium into a lime salt which was washed with ether to remove unaltered oil, and decomposed by muriatic acid.

The acid floating in the water was now soluble both in alcohol and ether, from which it appears that the black fluid was a true fat, and is probably the same oil which is extracted by ether, but colored by a foreign body which could not be removed.

a. Resin.—It was soft, brown, had a bitter taste, and very soluble in ether and hot alcohol, the latter solution when strong becoming cloudy on cooling; sparingly soluble in alcohol of 20°, imparted a slight tint to acetic and muriatic acids; dissolved in oil of vitriol with evolution of heat, but was reprecipitated by water apparently unaltered; sparingly soluble in potassa solution in the cold, more freely with heat, and is partly reprecipitated by water. Its alcoholic solution is not precipitated by alcoholic solutions of the acetates of lead and corrosive sublimate; is precipitated white by water, and bulky greenish white by yellow prussiate of potash.

The hard resin consisted of β resin slowly soluble in hot alcohol, with a brown color; and a hard black γ resin, wholly insoluble in alcohol and ether.

The solution of β tested acid, and was precipitated by subacetate of lead; both were soluble in potassa solution with a brown color, and in sulphuric acid, but other acids had very little effect on them.

3. *Displacement by Ether.*—Aqueous ether, freed from alcohol, was next employed by displacement as before, until the solution ceased to show fat by evaporation on glass or paper. The greater part of the ether having been removed by distillation, and the

remainder by exposure in the air pump; the residue was an almost colorless oil, from which a very small quantity of solid fat or wax separated by long repose. The solid was in too small amount to admit of its exact determination.

After complete extraction by water, alcohol, and ether, a substance remained which was separated from the sand by washing, and subjected to a few experiments. When treated with potassa-lime it evolved copious ammoniacal fumes, indicating a large content of nitrogen. Being prepared in the warm season, it soon commenced putrefying, which precluded further investigation into its nature. I may however state, that it closely agreed in its behavior with fungin.

The ash was determined by first removing the oil and a portion of the resin by ether, and burning the balance carefully in a platinum crucible, which gave a more correct result than if the whole ergot had been burnt off.

The following are the results of the analysis:

Gum, and a small amount of extractive,	7·940
Nitrogenous extractive, and Sugar,	13·648
Albumen,	0·430
Soft brown resin α,	3·637
Hard black resins β and γ,	1·370
Black oil,	1·702
Colorless oil,	32·377
Solid fat or wax,	0·075
Ash,	4·440
Fungin, &c., insoluble in water, alcohol, and ether,	34·381
	100.000

Description of the Colorless Oil. The oil as obtained had a faint yellowish color, with a taste and odor similar to Castor oil. It had the specific gravity 0·9252, at a temperature of 60° F., and according to Wiggers, congeals at—22° F. It was very soluble in ether and chloroform, but almost insoluble in alcohol. When thoroughly washed successively with ether, alcohol and water, it was destitute of odor, and had an agreeable sweet taste. If too high a temperature be used to separate the oil from its ethereal solution the color is considerably deepened, but if carefully evapo-

rated at a low temperature it is almost colorless, and if under the air-pump entirely without color. As will be shown, it has the same ultimate constitution as castor oil, and its fat acids indicate a similar constitution to those of the latter oil in their combinations with bases.

I determined the composition of the pure colorless oil by burning it off with the oxide of copper and chromate of lead. The results of this analysis of oil of ergot are as follows:

	Oil.	*Carbonic Acid.*	*Water.*
I.	7·780 grs. yielded	——	8·050
II.	8·265 " "	22·43	8·545
III.	9·005 " "	·24·35	9·460

These correspond to

	I.	II.	III.	*Average.*
Carbon	——	74·011	73·75	73·880
Hydrogen,	11·491	11·483	11·67	11·548
Oxygen	——	14·506	14·58	14·572
		100·	100·	100·

The result agrees with the analysis of castor oil, which, as before stated, this oil resembles closely in its odor and taste, but differs essentially from it in its insolubility in alcohol.

A portion of the oil being saponified by potash, a lead soap was prepared from it, of which four ultimate analyses were made, but it could not be obtained of constant composition, and yielded very unsatisfactory results. The lime soap was also examined and gave unsatisfactory returns.

Several analyses of the barytic soap gave the following results:

	I.	II.	III.	*Average.*	*Equiv.*	*Calculated.*
Carbon,	——	56.458	58.91	57.684	33	57.48
Hydrogen,	8.499	8.766	8.36	8.541	30	8.71
Oxygen,	——	34.776 (Oxygen and Baryta)	32.73 (Oxygen and Baryta)	11.405	5	11.61
Baryta,	——			22.370	1	22.20
		100.000	100.00	100.000		100.00

It was shown that the oil after cooling below 32° F., separated a very small amount of solid fat, which was removed. The balance being saponified by potassa and treated with chloride of cal-

cium, the lime soap thus formed was decomposed by muriatic acid, and the fat acid cooled below 32° F. and pressed at that temperature. The minute quantity of solid fat thus obtained, confirmed the conclusion that the greater part of the oil of ergot consists of an olein.

By substracting the formula of the acid in the barytic salt from the formula of the oil, ($C_{41}\,H_{37}\,O_6$—$C_{33}\,H_{30}\,O_5$), we have the formula $C_8\,H_7\,O$, which might be viewed as oxide of lipyl conjugate, with $C_5\,H_5$, or as oxide of lipyl with H replaced by $C_5\,H_6$.

Thus, $C_3 \left\{ \begin{matrix} H \\ C_5\,H_6 \end{matrix} \right\} O, = C_8\,H_7\,O.$

If we compare the formula of the acid with that of ricinoleic acid, as determined by Svanberg and Kolmodin, and with the same as given by Saalmüller, we find the conjugates 3 C H and 5 C H.

		Difference,—	
Ergotoleic acid,	$C_{33}\,H_{30}\,O_5$		
Ricinoleic acid,	$C_{36}\,H_{33}\,O_5$,	$C_3\,H$	Svanberg and Kolmodin.
Ditto, "	$C_{38}\,H_{35}\,O_5$,	$C_5\,H_5$	Saalmüller.

It is possible that, from the difficulty of obtaining satisfactory results from the analysis of its salts, the oily acid of ergot may be $C_{34}\,H_{31}\,O_5$, which would make it differ by the common conjugate $C_2\,H_2$ from the ricinoleic acid of Svanberg and Kolmodin, as the latter differs from that of Saalmüller.

Saalmüller informed Prof. Booth that he had experienced great difficulty in determining his acid from its constant liability to change in constitution.

Analysis of the Ashes of Ergot.

In order to avoid the loss of mineral matter in ergot, by volatilization during incineration, a fresh portion in fine powder was treated with ether, by which more than a third part was extracted, without losing any of the mineral components. The residue then carefully calcined at a low temperature, yielded 4.44 per cent. of ash.

The ash was then treated with water, by which it was divided into a soluble and insoluble portion, each of which was separately analysed.

1. The soluble portion, after evaporation to dryness and treatment with a little nitric acid, was mixed with diluted alcohol, by which the sulphate of lime was obtained. The phosphate of magnesia was then thrown down by ammonia, after getting rid of the alcohol and nitric acid. The solution was then divided into two parts, one of which was employed to determine chlorine, sulphuric acid, and magnesia; the other for the alkalies and magnesia. The quantity of chlorine was not appreciable.

2. The insoluble part of the ash was treated as a silicate, to obtain silica, and the muriatic solutions precipitated to get the joint weight of the phosphates. These were fused with carbonate of soda, the phosphoric acid determined by iron from the aqueous solution, and the bases in the usual manner.

A serious loss occurred in the insoluble portion, the cause of which I could not discover without a repetition of the whole analysis, which want of time prevented.

The following are the results of the analysis of ash from 100 parts of ergot:

Sulphate of lime, - - - - -	1.184	
Phosphate of magnesia, - - - -	0.380	
Sulphate of potash, - - - - -	0.038	
Carbonate of magnesia, - - - -	0.108	
" of soda, - - - - -	0.554	
" of potash, - - - - -	1.000	
Total soluble salts, - - -		3.264
Silica, - - - - - - -	0.366	
Phosphate of magnesia, - - - -	0.187	
" of iron, - - - - -	0.092	
Loss, - - - - - - -	0.531	
Total insoluble salts, - - -		1.176
Amount of ash analysed, - - -		4.440

In thus presenting an analysis of ergot as the subject of a thesis, I may be permitted to add my regrets that I did not succeed in ascertaining the characteristic principle, if there be one. I am

not prepared to say that there is not present an either fixed or volatile alkaloid, for I have reason to believe there is, although I was unsuccessful in obtaining it; but I feel quite confident that if there be, it exists in very minute quantity.

If the assertions made by previous investigators be true, that both the expressed oil, and that obtained by ether and deprived entirely of resinous matter by washing with alcohol, are medicinally inert, such a fact certainly favors the conclusion that the activity of ergot is either due to the resin, (as maintained by both Wiggers and Pardue,) or to an alkaloid.

One of the best published analyses (up to the present time) of ergot seems to have been made by Wiggers, and although at first sight it seems to be very full, a practical examination will show its defects.

As the ergot I examined was of German origin, it was probably of the same general character as that examined by Wiggers. My analysis is confirmatory of his for the most part, but does not agree with it altogether. It appears that the discrepancies exist principally in the minutiæ of analysis, and in the organic part of the investigation. We both obtained the same amount of oil, which has been shown to constitute more than one third of the whole constitution of ergot, and after extracting everything which the different menstrua would bring away, the amount of fungin remaining in each case approximates.

We differ as to the amount of albumen, which I experienced great difficulty in separating completely from the other constituents.

We agree in the description of the oil, except as to its saponification; for his assertion that the oil is not saponifiable, I have shown to be totally incorrect. The solid fat deposited from the oil by repose, he calls cerin.

M. Pardue, who made an examination of ergot, has been guilty of the same error in stating that the oil obtained by ether is not saponifiable, (*Chemical Gazette*, vol. ii .page 495.) This is probably one reason why the chemical constitution of this oil has not been before examined.

Although in the respective analyses of ergot made by Wiggers, Vauquelin, Duhamel, Legrip, Pardue and Bonjean, resin is

treated of, none of them have recognized the presence of more than one resin. Wiggers and Pardue both attribute the medicinal activity of ergot to its presence. They were evidently not aware of the existence of these resins.

M. Pardue's description of the oil after treatment with alcohol, entirely to deprive it of resinous matter, viz: that it has then scarcely any color, a bland, sweet taste, and is medicinally inert, I found to be correct so far as the taste and color are concerned, but I am ignorant of its therapeutical properties.

With regard to the physical nature of ergot, the conclusion drawn from my examination is, that it is a fungus. There is still, however, an open field for the investigation of ergot, but I must, at present, abandon the subject, content with having at least in some degree contracted its limits by my investigation, wishing others success in any similar undertaking.

ON NARCOTIC PLANTS GROWN IN THE UNITED STATES, AND ON THEIR MEDICINAL VALUE COMPARED WITH THOSE OF EUROPEAN GROWTH.

(Being an Inaugural Thesis presented to the Philadelphia College of Pharmacy.)

By ALFRED JONES.

It is a fact of no small interest to the pharmaceutist of this country, that whilst the plants which furnish the physician with a number of his most important remedial agents, grow in abundance almost at our own doors, he depends for them on a country more than three thousand miles distant. Among these we find Belladonna, Hyoscyamus, Conium, and Digitalis If we attempt to trace this preference to its cause, two questions at once arise. First, is it from a want of care and pharmaceutical skill in the preparation of the medicines for exhibition; and, secondly, is it from our climate not being suited to the full developement of the activity of the plants, or from these two causes combined?

To answer the first question, we must examine the miserable preparations which under the names of "Extract of Conium," etc.,

are thrown into the market in immense quantities from sources which it would be in vain to trace, and at prices, too, which would be perfectly ruinous to responsible manufacturers. We shall find these *extracts* black and opaque, almost insoluble in water, and of an herbaceous, and frequently strongly empyreumatic, in place of a narcotic odor, giving unquestionable evidence of their mode of preparation. Is it strange then, that, while such *trash* constitutes about two thirds of all manufactured in the United States,* the skilful practitioner should look elsewhere for a reliable article.

The second question is one much more difficult of solution, and one, an answer to which I have attempted in the following experiments. The first was with Conium maculatum, obtained at the time of flowering, both in New York and in this State. One was the wild and the other the cultivated plant, but by the eye they could not be distinguished; in size they were but little inferior to a very fine specimen of the foreign herb. On bruising with caustic potassa, the peculiar odor of the alkaloid conia was copiously developed. After the above examination, the leaves were bruised with a small portion of water, subjected to powerful pressure, the same repeated, and after allowing the solid particles contained in the liquors to subside, the whole was inspissated in a vacuum apparatus prepared for the purpose, at a temperature of 115° F., the process being nearly that of the United States Pharmacopœia. The only object in retaining the albumen and chlorophylle, (they being now almost universally admitted to be inert), was to make a more just comparison with the English article in which they are still combined. The extract, when finished, was of a greenish brown color, and in its sensible properties compared favorably with any specimen I could obtain. Equal portions of it, and a preparation, from one of the most celebrated transatlantic laboratories was taken, and after the addition of water, and a small quantity of caustic potassa, half an ounce of liquid was obtained from each by distillation. These distillates had the odor of the plant in a nearly equal degree; but from the small quantity of extract which could be devoted to this experiment, it was found impossible to isolate the alkaloid in any measurable quantity. On

* The excellent quality of the preparations of two or three manufacturers will of course exclude them from this class.

the addition of a solution of tannin, however, precipitates of the tannate of conia were thrown down, which precipitates, after being collected and dried without artificial heat, weighed from the American plant 3, and from the English $3\frac{1}{4}$ grains.

The effects on the system of the extract from this plant, particularly as an antispasmodic and anodyne, afford still stronger proofs in favor of our own preparation, as being at least equal to that which we import: besides being several times tried in private practice, it was, through the kindness of the resident physicians, substituted for the foreign article in three of our public institutions, and the result carefully noted. In no instance was it found inferior to the preparation before in use, and in one case it was thought to be decidedly more active.

The Belladonna and Hyoscyamus experimented upon were from plants cultivated expressly for the purpose; a rich loose soil was found best suited to their developement, their growth was luxuriant and even rank, reminding one of the stramonium found wild in the neighborhood of this city. The herb was collected during the time of flowering in the second year; the average size of the leaf was in the Hyoscyamus greater, and in the Belladonna about the same as in the English plants; the peculiar odor exhaled by the former, while growing, was so strong as to have a sensible effect on persons remaining for some time near it. An extract was prepared from each in the same manner as from the conium, and it was in this form that their curative powers were tested; the trial was an extended and I believe a thorough one, having been continued for some months. The result as noted by persons intimately acquainted with the action of these medicines, has been even more favorable to the American plants than we could have expected, as in every case in which they were employed, they were found quite as speedy and efficacious in their action as any preparation before in use. The important position which Belladonna now occupies in the treatment of diseases of the eye, from its power of dilating the pupil, induced me to have it separately tried for this purpose. This was effected through the kindness of Dr. McIntyre, of the Wills Hospital, who used it for some time in that institution, without finding it at all inferior to the English extracts heretofore used.

I had hoped to be able to extend these experiments to the Digitalis, and for this purpose set out a number of the plants, but an unfortunate occurrence destroyed them while young, and thus prevented my doing so.

ON CORTEX PRUNI VIRGINIANÆ.

(*Being an Inaugural Essay presented to the Philadelphia College of Pharmacy.*)

By Joseph S. Perot, of Philadelphia.

The tree producing this bark, called by De Candolle, Cerasus serotina, by Michaux, Cerasus Virginiana, is to be found throughout almost all parts of the United States. It is particularly abundant and fully developed in Ohio, Kentucky and Tennessee; and also abounds in Pennsylvania and New Jersey. In some instances it rivals in beauty and magnificence the finest productions of the American forest; but, as usually met with, seldom exceeds 30 or 40 feet in height, with a trunk from 10 to 12 inches in diameter. The general surface of the bark at the first glance appears to be smooth, but on closer inspection is found to be rough and blackish, detaching itself in semicircular plates, which adhere for a time to the tree, previous to dropping off; these are several inches long, from half an inch to two inches in diameter, and become somewhat curved laterally from drying. The foliage, though handsome, is thin compared with that of some of our other trees; the leaves are from two to four inches in length, supported alternately on petioles, serrate, pointed, and of a green color; the flowers are white and appear in spikes. The inner bark is the part employed in medicine.

Among the indigenous plants of the American Continent, there are few whose qualities are more valued or which are more extensively resorted to, both in the regular medical, and also in domestic practice, than the Prunus Virginiana; the following extract from the Dispensatory of Messrs. Wood and Bache will show the reputation in which it is held as a remedial agent.

"This bark is among the most valuable of our indigenous re-

medies. Uniting with a tonic power the property of calming irritation and diminishing nervous excitability, it is admirably adapted to the treatment of diseases in which a debilitated condition of the stomach, or of the system, is united with general or local irritation. When largely taken, it is said to diminish the action of the heart, an effect ascribable to the hydrocyanic acid which it affords. The remedy is highly useful in the hectic fever of scrofula and consumption, in the treatment of which it has long been a favorite with many American practitioners." It is very useful as an ingredient of compounds for the remedy of pulmonary complaints, and has also been resorted to in cases of dyspepsia and in the general debility which often succeeds inflammatory diseases.

This bark being undoubtedly an important article to the physician, I undertook a few experiments with a view towards ascertaining at what season its properties (which depend principally for their efficacy on the amount of prussic acid which it will yield) exist in greatest perfection, and consequently when the bark is best adapted for collection. For this purpose I procured at intervals during the season in which it is brought to market for sale, portions of the inner bark from the same tree, (or from trees of apparently the same age,) and from portions of the largest branches of about the same age, which, being carefully dried and deprived of the epidermis, were bruised, macerated for a short time with water, and distilled in a close vessel; the product was treated with weak solution of nitrate of silver, which, reacting with the prussic acid in the solution, formed a precipitate of cyanide of silver; this being carefully washed, dried and weighed, the quantity of hyodrocyanic acid in each portion of bark was estimated by the ratio of chemical equivalents. The distillate was also treated with a strong alkaline solution, and afterwards with a weak solution of nitrate of silver in the manner proposed by M. Liebig, (See American Journal of Pharmacy, vol. xxiii. page 253) but the results coinciding very closely with those obtained by the former process, it was deemed unnecessary to enumerate them.

The results obtained from these experiments, with the dates at which the bark was collected, may be seen by the following statement.

1000 grains of Bark collected	April 1st, 1851,	yielded	.478	grs.	Pruss. acid
1000 " " "	May 20th	"	.856	"	"
1000 " " "	June 18th	"	1.007	"	"
1000 " " "	August 28th	"	1.134	"	"
1000 " " "	October 16th	"	1.436	"	"

The bark used in the preceding experiments was taken from a flourishing tree in Philadelphia county.

1000 grains of bark collected May 23d, from the trunk of a tree in Jersey, yielded .876 grains of prussic acid.

1000 grains collected June 13th, from the trunk of the same tree, yielded 1.159 grains.

In order to ascertain how the bark which has been kept on hand for a length of time compares with that freshly collected, I made an experiment about the middle of October upon some bark which had been collected during the previous spring, and found 1000 grains to yield .567 grains of prussic acid.

It being the opinion of several eminent members of the medical profession, that this bark contained also phloridzin, a principle known to exist in the bark of the apple and of some other fruit trees, to the possession of which they supposed its tonic property might be owing, I made a number of experiments in the manner directed for the preparation of phloridzin, both upon old specimens of bark, upon fresh bark of the branches and trunk of the tree, and upon fresh bark taken from the root under ground, at several successive times, but in all instances failed completely to detect any indications whatever of the principle sought.

ON THE PREPARATION OF MERCURIAL OINTMENT.

Mount Holly, Jan. 22, 1852.

To the Editor of the American Journal of Pharmacy:

Dear Sir:—Some years since my attention was directed to some improved, or at least more economical way of making mercurial ointment, than that directed in the Pharm. of the U. S., and the Dispensatory of Wood and Bache, from the fact of its being very tedious and laborious; connected with which the un-

pleasantness of having it about the shop during the operation of rubbing or triturating in a mortar.

I resolved to adopt some labor-saving method, which was put into operation and succeeded beyond my expectations. Specimens were submitted to several persons, among whom was Daniel B. Smith of your city, and it met the unqualified approval of every one. Subsequently I sent to Dr. G. B. Wood my mode of operating, who, in reply, requested I would communicate the same to you, which I herewith annex. My mode of preparing it, has been to use neats foot oil, and after forming the mixture with the mercury, to add suet to bring it to a proper consistency. Dr. Wood suggested another formula, which is to use lard oil, then to add stearine in proper proportions. I have no doubt but the latter would be equally good with the former, but perhaps no better for the desired purpose. The proportions of oil and suet, or stearine, may be varied to suit the climate and the season.

Take of mercury any quantity—of oil, say one-third or one-half as much—put them into a stone bottle or jug of capacity sufficient to hold three or four times the bulk of the mixture; having securely wired the cork, attach the bottle to the saw-gate of a saw mill, (any other quick vertical motion may be adopted,) the mixture is there submitted to continual agitation for three days; at the expiration of which time it will be found to be perfectly incorporated, and without the minutest globules of mercury being discernible. To this mixture add sufficient of suet or stearine to equal—with the oil already used—the quantity of mercury. The suet should be melted, then mixed, and stirred until cold.

If the above is worthy your attention, you are at liberty to make such use of it as you may think proper. One thing is certain, in making the ointment, you always know that you have it of the proper strength, which is not equally so when bought from others.

I remain, very respectfully, yours, &c., PETER V. COPPUCK.

[NOTE.—We see no objection to the process of our correspondent, on a small scale, except that the kind of motion described will not be found in the vicinity of most stores, which gives it but a local value. The suggestions of Fosembras and Simonin, (See U. S. Dispensatory,) to use a little oxidized lard, (or what is better, in my experience, an ounce of *old simple cerate*,) in lieu of the suet, will be found universally convenient by those who wish to prepare this ointment quickly and well. Any objection on the ground of the rancid cerate is more apparent than real.—ED. AMER. JOUR. PHARM.]

HYDRARGYRI IODIDUM RUBRUM.

New York, Feb. 10th, 1852.

Editor of the American Journal of Pharmacy;

Sir:—Under the article, Hydrargyri Biniodidum, the U. S. Dispensatory gives as the dose 1-16th of a grain, gradually increased to grain 1-4th.

Under the same head, Christison's work, edited by Dr. Griffith, ed. 1848, gives the dose from *gr. i.* to *gr. iv.*

Has this great discrepancy been before detected, and the error corrected? STUDENT.

[NOTE.—The Profession will be obliged by the above hint. We had not observed the error before. Since communicating the fact to the Publishers, Messrs. Blanchard & Lea, they have informed us that the error has been corrected in the unsold portion of the edition. All who have the American Edition of Christison should make the correction with pen at once, and all Medical Journals should notice it.—ED. AM. JOUR. PHARM.]

REPORT ON SOLUBLE CITRATE OF MAGNESIA.

By EDWARD PARRISH AND AMBROSE SMITH.

(*Read at the Pharmaceutical Meeting held February 2d,* 1852.)

At the last Pharmaceutical Meeting the subject of a new method of preparing Citrate of Magnesia, in the solid form, so as to be quite soluble, having been introduced to notice by one of the undersigned, it was thought deserving of further attention, and was accordingly referred to us for examination.

Our knowledge of this method is derived from *L'Officine*, a recent French work on Pharmacy, by Dorvault, which belongs to the College Library, and has already been noticed in the Journal.

This work being in a foreign language and not generally accessible, we have translated and here insert the most important part of the article on the citrate previous to giving our own experiments and conclusions.

After relating the history of the discovery and introduction of the magnesia lemonade, or, as we call it, the solution of citrate of magnesia, the author proceeds: "Until now, no satisfactory pro-

cess has been published for obtaining citrate of magnesia solid and perfectly soluble. We present one which is our own, and which is perfectly successful. It is very simple.

Take of	Crystallized Citric Acid,	100 parts.
	Calcined Magnesia,	29 "
	Water,	10 "

Dissolve the acid with the water, then gradually add the magnesia; or better, omit the water, and on a sand bath melt the acid in its water of crystallization, and thoroughly incorporate the magnesia with it. In either case we obtain a mixture of a pasty consistence, which soons hardens, and may be pulverised for use.

"The citrate thus prepared is neutral, and yet very soluble even in twice its weight of water. But from so concentrated a solution it soon precipitates as a hydrate, which is insoluble even in a large quantity of water. Dissolved in a certain quantity (say 8 or 10 times its weight) of water, its solution is permanent. We call it *Citrate de Magnésia officinal.**

" The 29 parts of oxide of magnesium may be replaced by 64 parts of hydro carbonate of that base. In this case the reaction is accompanied by a disengagement of carbonic acid, and the product is light, porous, white, and has the aspect of bicarbonate of soda before being powdered. It is rather insipid; if an agreeable acidity is desired, the proportion of acid as above should be augmented 4 parts."

Your Committee have prepared the salt by the above processes, and submit samples of it herewith. It will be remarked, that instead of being neutral and insipid as described they have a more or less acid taste, and a decided acid reaction with litmus. The solution which is made from it by a formula to be given presently, is about as acid as that usually sold in the shops and directed by the Pharmacopœia.

The formula does not agree exactly with the proportion generally employed to form a solution of the neutral salt. Viewing citric acid as a tribasic acid, containing 1 equivalent of water of crystallization, (C_{12} H_5 O_{11}, 3HO,) HO, its combining number would be 201; while that of magnesia is 20; hence the salt (3MgO, $\overline{\text{Ci}}$,)

* The term officinal in French is equivalent to our word permanent or ready-made, as contradistinguished from extemporaneous.

would require the employment of 201 parts of citric acid to 60 of magnesia. The citric acid employed by Dorvault must be that expressed by the formula, $(C_{12}\,H_5\,O_{11},\ 3HO)\ 2HO$, which is obtained by precipitation from a hot solution, and which it is believed is rarely met with in our shops. Moreover, we must not overlook the fact that the best calcined magnesia of commerce is always more or less hydrated, and contains traces of carbonic acid. That used in preparing the accompanying specimens, a fair commercial article, was carefully examined. It effervesced on the addition of acid, and 50 grains thoroughly calcined in a platina crucible over a counter blow pipe, and weighed immediately, lost 4·5 grains, equal to 9 per cent.

From these discrepancies, both in regard to the acid and base, we are led to suggest the following proportions, as more nearly representing the actual equivalents.

Take of	Citric Acid Crystallized,	100 grains.
	Calcined Magnesia,	35 "
	Water,	15 drops.

Proceed as in the other case.

By the use of these proportions, the 5 additional drops of water being rendered necessary from the fact of the citric acid containing only one equivalent of water of crystallization instead of 2, we should very readily prepare the neutral and soluble citrate, but for a practical difficulty arising out of the great comparative bulk of the magnesia, and the very small quantity of the liquid to absorb and combine with it. A portion of magnesia is almost unavoidably left uncombined, hence the acidity of the salt, and being mechanically mixed with the salt, it remains suspended when thrown into water, and gives it the appearance of partial insolubility. To obviate this last difficulty, the mass, when first taken from the capsule, and while passing into the brittle and pulverulent condition, should be dusted of all the adhering magnesia before being powdered. The heavy and very fine magnesia of C. Ellis & Co. was tried, but the combination was less complete than with the light magnesia of commerce. The action was so immediate and violent, that a portion of the magnesia was enveloped in the pasty mass without coming fully into contact with the fused acid, thus producing a very acid salt mixed with uncombined magnesia.

Equivalent portions of the crystallized acid reduced to powder, and calcined magnesia, were thoroughly triturated together, moistened with water into a paste, and heat applied until the combination ceased, and it was nearly dry. In this way a neutral citrate may be prepared, by mixing about 34 parts of magnesia with 100 parts of citric acid, adding enough water to make the mixture pasty, and drying immediately in the evaporating dish over the fire, constantly stirring. This method, with the observance of certain precautions which will be indicated by experience, will probably be found most convenient in practice. In our experiments, however, though sometimes succeeding, it frequently failed. When the water is added to the mixed powders heat is generated, and frequently the water appeared to combine immediately with a portion of the powder, which became hard and lumpy, making it impossible to moisten the whole of it, without adding considerable additional water; when this occurred, the resulting citrate was always more or less insoluble.

One difficulty in the preparation of the soluble salt is the necessity of properly regulating the heat; as a water bath heat is insufficient, recourse must be had to a direct application of heat, or to a sand bath, in either of which the heat is liable to be too high, and without great care will decompose the citric acid, and spoil the salt. Neither is it desirable to prolong the application of heat to the acid after it is fused, before adding the magnesia, as it then loses a portion of its water of crystallization. Care should be taken to remove the mass from the fire before it is in any degree decomposed, and yet it should be so dry as to pass in a few minutes into a hard and rather brittle condition.

A specimen is herewith presented of citric acid deprived of its water of crystallization, which we prepared by the long continued application of a carefully regulated heat to the crystallized acid. There is great danger of decomposition in this process.

The acid thus prepared is a nearly white amorphous pulverulent soluble substance, supposed to possess the chemical affinities of of the acid in an increased degree. It was mixed with an equivalent portion of magnesia and thrown into water with a view to the formation of the salt extemporaneously, but without success. A specimen of this mixture is presented.

In conclusion, we would express the belief that the soluble citrate of magnesia, although not calculated to supercede the effervescing solution now in use, when that can be readily obtained, is a useful and valuable addition to the materia medica.

Though as obtained by us in the course of our somewhat hurried experiments, it contains a small excess of the acid, there can be little doubt that further experience will enable us to produce it more nearly neutral, a desideratum less important from the fact that a small excess of acid improves its taste, without materially interfering with its therapeutical applications. The dose of the salt is generally stated at one ounce.

Its advantages may be thus summed up:

1st. It will keep, as far as we know, without losing its properties.

2d. It is portable, a dose occupying about 1-10th the bulk of a dose of the solution.

3d. It is more readily divided into large or small quantities to suit the means and wants of purchasers.

4th. It may be readily incorporated with other substances in prescription without materially increasing their bulk.

5th. It may be employed to make the solution extemporaneously, so as at all times to have it fresh, by the following formula:

Take of Soluble Citrate of Magnesia,	1 ounce.
Water,	8 fluid ounces.

Make a solution, transfer to a suitable bottle, and add

Syrup,	1½ fluid ounces.
Bicarbonate of Potassa,	40 grains.

Cork immediately and securely,

If the citrate is neutral it will require the addition of a portion of citric acid, or the employment of lemon syrup. It may be flavored to suit the taste. A specimen is presented prepared as above.

OBSERVATIONS ON THE CULTIVATION OF THE POPPY AND THE MANUFACTURE OF OPIUM IN BRITISH INDIA, MORE ESPECIALLY AT BENARES, TAKEN CHIEFLY FROM A REPORT TO THE BENGAL GOVERNMENT.

By W. C. B. Eatwell, M. D., of Calcutta.

[The following interesting account of the Opium culture and manufacture, under the direction of the East India Company, has been carefully abridged from a Report by Dr. Eatwell, First Assistant and Opium Examiner at Calcutta; and the illustrations are from a paper on the same subject by the Editor of the Pharmaceutical Journal, (which were taken from paintings in the Great Exhibition accompanying the deposit of this branch of industry by the East India Company,) in which work they were published in the numbers from Nov. to Feb. inclusive. The intrinsic interest of the paper is our only apology for its great length even in its condensed form.—*Ed. Amer. Journ. Pharm.*]

The cultivation of the poppy in British India is confined to the large central Gangetic tract, about 600 miles in length and 200 in breadth, which is bounded north and south by Goruckpore and Hazareebaugh, and east and west by Dingepore and Agra.

This large extent of country is divided into two agencies, the Behar and the Benares, each presided over by an Agent; that of Behar at Patna, that of Benares at Ghazeepore. There is a central factory at each agency. The control of the entire department is vested in the Board of Customs, Salt, and Opium at Calcutta. The Behar agency produces three times more opium than that of Benares.

The Benares agency comprises eight divisions, the aggregate amount of land under poppy cultivation in which, during the season 1849–50, was 107,823 Beegahs (3025 square yards each.)

Each division is under the management of a sub-deputy opium agent, who resides at a central factory, at which the produce of his division is collected and forwarded to the Sudder factory at Ghazeepore.

All correspondence between the agent and sub-deputy agent, passes through the hands of the deputy opium agent, who, besides being answerable to the agent for monies expended by the sub-deputies, is charged with the investigation of all suits which may arise out of matters connected with the department; and whilst

upholding the sub-officers, is bound to see justice done to the cultivators when imposed upon. As the duties of the sub-deputy agency are numerous, there are a number of subordinates called *gomashtas*, each of which has a special district, called *kotee illaqua*, of such extent that he can give personal care to the operations conducted in it. The head quarters of the gomashta is called the *kotee*, which is built in a central position, and contains his treasury, under the custody of a *tehvildar* and his accountants.

The sub-deputy agent having concluded his agreements with the cultivators, it is the gomashta's duty to measure out the land according to the contracts. His further duty is to pay the cultivators of his illaqua their advances, and to receive and weigh their produce, for the safe delivery of which at the factory at Ghazeepore, he is held responsible. The gomashta has also under his direction subordinates called *jemadars* and *zilladars*, who personally overlook the cultivators in every stage of the culture. There is also in each division a general officer called a *mohotomim*, who, by keeping a supervision of all that happens, acts as a check to the sub-deputy and his assistant. Some idea may be gained of the extent of the Benares agency when it requires near 150 first class officers, and 1200 subordinates, in constant employ, and a much larger number in the manufacturing season at the factories.

Of the cultivators, there were in 1849–50 no less than 21,549 *lumberders* or contractors, and 106,147 laborers, not to speak of the families of the latter who are more or less interested in the business.

So well regulated are the affairs of the agency, that all works smoothly; the officers have clearly defined duties, the cultivators have justice done them, and are not compelled to work except as they contract with the lumberders, who in turn are bound by an agreement written in Hindee called a *hath chittee*, which sets forth the contract and the penalty of its infringement. This document contains the names of the lumberder and his laborers, the quantity of land each agrees to cultivate, the gomashtas' measurements, the receipts for monies received, the weight and consistence of all opium delivered, and its value. Hence, when the lumberders make their final settlement with the sub-deputy agent in person, the hath chittee enables that officer to see at a glance the condition of

each account. To enable the contractors to go on with their operations, money advances are made from time to time equal in all to one half of the average produce. The first advance is made on completing the agreement in September, the second after the sowings in November, and the final, or *chooktee* payment, is made on the delivery and weighment of the produce. This arrangement is very fair for the cultivators, and it is a rule that the accounts of one season must be settled before any new contract is began. When the cultivators behave fraudulently in reference to advances, they are at once prosecuted; but if their default is from calamity unavoidable, the debt is generally placed in the profit and loss account. The fairness of the system is manifested by the readiness with which the natives engage in the service.

Lands are selected for poppy cultivation in the vicinity of villages, where facilities for manuring and irrigation are greatest. When the soil is rich in such situations, a crop of maize or vegetables is taken off in the rainy season previous to the preparation of the ground for the poppy crop in September. When the soil is poor, no extra crop is raised; and from July to October the ground is dressed, cleaned and manured as much as possible, and in October, just before the sowing, is ploughed and rolled.

The land produces very differently. Under favorable circumstances, as much as 12 or 13 seers (26 lbs.) of opium is yielded by each Beegah (3,025 square yards) of land; in unfavorable seasons only 3 or 4 to 6 or 8 seers.

The chemical examination of soils, in connection with their opium producing powers, presents a field for profitable and interesting enquiry; nor is the least important part that which has reference to variation in the proportions of the alkaloids (morphia and narcotina,) which occur in the opium of various localities. That atmospheric causes are influential is probable; that they influence the *amount* of the product and its physical appearance, are facts well known to every cultivator. Thus, dews facilitate the flow of juice, increase its quantity, but render it darker and more liquid. An easterly, damp wind, retards the flow of juice and renders it dark and liquid. A moderate westerly wind, with dew at night, form the conditions most favorable for collections, both as regards quantity and quality. If this wind (which is very

dry) blows violently, the exudation is sparing. Whilst these effects are well marked and traced to meteorological influences, the causes of variations in the chemical constitution of the products are more obscure ; but it is probable that the causes mentioned in connection with variable soils, are chiefly influential.

Dr. O'Shaughnessy found the morphia in eight specimens of Behar opium to vary from $1\frac{3}{4}$ to $3\frac{1}{2}$ per cent. and the narcotina from $\frac{3}{4}$ to $3\frac{1}{2}$ per cent., the consistence of the opium varying from 75 to 79. Opium from the Hazareebaugh district yielded $4\frac{1}{4}$ per cent. of morphia and 4 of narcotina, (the consistence being 77,) whilst a specimen of garden Patna opium afforded $10\frac{3}{4}$ per cent. morphia and 6 per cent. of narcotina, the consistency being 87. It is to be regretted that the soils which produced these specimens were not analysed. The climate in which the garden Patna opium was produced, was precisely the same as that influencing the production of the poorer specimens, and therefore could not have exerted much influence in their variations.

The white poppy only is cultivated in the Benares and Behar plantations. In situations favorable to its growth, it vegetates luxuriantly, attaining usually a height of four feet. The stem is branched and terminated by from two to five ovate globose capsules, averaging in size a duck's egg. (See fig. 2.) The plant requires $3\frac{1}{2}$ months to reach maturity, and is exclusively cultivated in the cool season from November to March. The seed are changed every two or three years, and certain districts that produce them of superior quality, yield supplies to less favored localities.

The soil having been prepared as described, the seed are sown broad-cast between the 1st and 15th of November. In three or four days the land is ploughed to bury the seed and then rolled. The whole surface is then divided into squares of ten feet, between which are channels for irrigation. In ordinary seasons two, and in dry seasons five or six irrigations are necessary. Germination ensues in ten or twelve days, and after the plants are two or three inches high, they are carefully weeded and thinned. The growth of the poppy is liable to injury from frost, from being stunted owing to late re-planting, or from excessive heat and deficient moisture. Blight and parasitical plants, (especially the Orobanche Indica,) also in some cases cause injury.

Fig. 1.

Native woman gathering poppy petals.

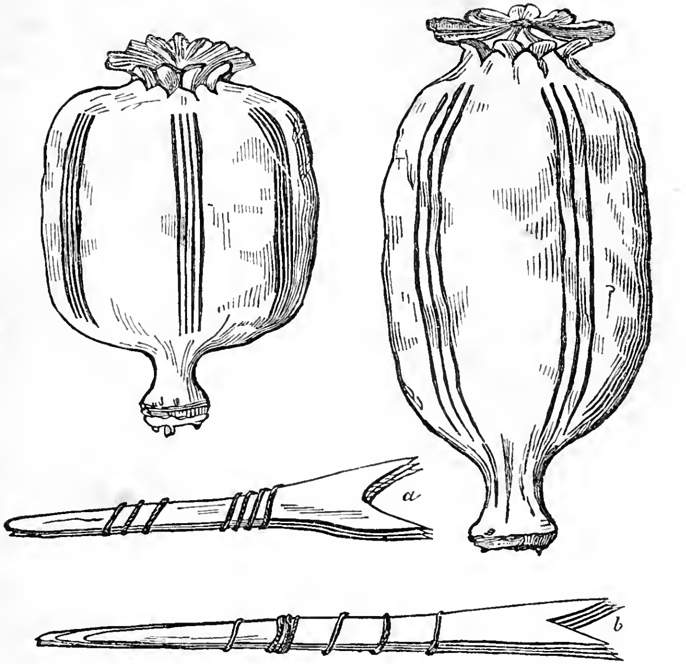
In February, the plant is generally in full flower, and towards the 15th the petals are carefully stripped off and collected, (see figure 1,) and subsequently formed into circular cakes, ten to fourteen inches in diameter by 1-16th thick, by placing them in layers, in a flat earthen vessel, moderately heated, so as to wilt them and extract a glutinous juice, which causes their adherence, one layer being added after another and pressed till the cake is completed. These cakes, which are technically called "leaves," are of different qualities, and are used in the formation of the shells for opium cakes.

In a few days after the removal of the petals, the capsules have attained their utmost development, when the process of collection commences, and extends from February 22d to March 25th.

The juice is collected thus:—At about three or four o'clock in the afternoon, the laborers repair to the fields and scarify the poppy capsules with sharp instruments called *nushters*. The nushter (see *a*, *b*, fig. 2,) consists of three or four narrow iron bars from three to six inches long, and of the thickness of a pen-knife blade, deeply notched at one end, and narrow at the other. The points constituting the notch are ground sharp, and constitute the cutting edges. The bars are bound together by cotton thread, which, by passing between, keeps the edges 1-16th of an inch apart; and when complete, the instrument presents fine cutting points on each side.

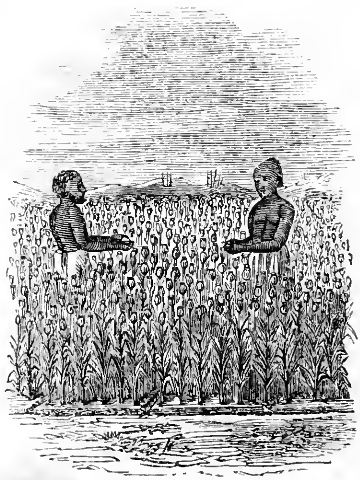
In using the nushter, only one set of points is employed at a time, the capsule being scarified longitudinally from base to summit, as in the figure. The blades only penetrate the pericarp, and do no not cut into the cavity of the seed vessels. The line of scarification is chosen along the lateral prominences of the capsule marking the attachment of the internal dissepiments, because of a horizontal section be made of a growing poppy head, the

Fig. 2.



Poppy heads and nushters, (natural size.) The poppy heads have been scarified

Fig. 3.



Natives engaged in scraping off the exuded juice.

juice will be seen to exude most from those points, owing to the much greater size of the vessels. Each capsule is scarified from two to six times according to its dimensions, with an interval between the operation of from two to three days.

Early on the following morning the collectors, provided with instruments called *seetoohs*, which are shaped like a small concave trowel, proceed from plant to plant, until the cavity is full, when they empty it into an earthen pot slung their sides.

After the plant is exhausted of juice, the capsules are removed, and the seed extracted and pressed to get the fixed oil, which is largely used for domestic purposes. The cake left is generally used for feeding cattle, but sometimes for a coarse bread, and medicinally for cataplasms. The capsules, deprived of seed, are also used for poultices and anodyne decoctions. The stems and leaves are allowed to dry in the field, and then, when broken into a coarse powder called 'poppy trash' they are used to pack the opium cakes.

When first collected, the juice from the capsules presents the appearance of a wet, granular mass, of a pinkish color, and a dark fluid collects in the bottom of the vessel, resembling an infusion of coffee, to which the name of "pussewah" is given. The recent juice strongly reddens litmus paper, acts rapidly on metallic iron and covers it with a crust of meconate of iron. The juice when brought home from the field is placed in a shallow earthen vessel, inclined so that the pussewah can drain off as long as any separates. The pussewah is set aside, and at the proper time, is taken to the Ghazepore factory to be weighed.

The opium now requires much attention. It is daily exposed to the air in the shade, is turned over every few days to render the inspissation uniform; and this is continued 3 or 4 weeks, or until the drug has reached nearly the standard degree of dryness. Standard opium according to the Benares regulations, will yield a dry residue of 70 per cent when subjected to a temperature of 200° F., till it ceases to lose weight. This is the consistency of the marketable opium, and the agents adhere as closely to it as possible. The payment of the cultivator is regulated also by this standard, his pay being less or more as the drug is less or more concentrated.

The opium on its arrival at the Ghazeepore factory, is emptied from the earthen pots in which it is received; and is weighed in wide tin vessels called *tagers*, care being taken that no larger quantity than 10 seers (20 lbs.) is brought to the scale at one time. The weighing is witnessed by the gomashta (or his agent) of the kotee to which the opium belongs, and in neighboring kotees the cultivators also attend.

This weighing is verified by an European officer in another room, and the tager and its contents is passed in to a table at

which the opium examiner, and a native opium examiner, called the *purkhea* are seated. The purkhea now plunges his hand into the centre and to the bottom of the vessel, stirs about its contents, feels in various directions for impurities, and then withdraws a handful, which he manipulates between his fingers to reveal its color, texture and fracture, and finally its aroma. He then throws a small portion on a plate and estimates its consistence by judgment. This estimate is written on a ticket by the European officer and is sent with the specimen to the laboratory, where an actual, evaporating and weighing trial determines its real value, which rarely differs more than one or two per cent. from the purkhea's guess. The examiner can pass nearly 2000 specimens daily. The quantity of passewah which the opium contains is carefully noted, and a fine is levied according to its excess, because it injures the physical qualities of the drug.

The *tactus eruditus* possessed by the purkhea is very remarkable, he rarely fails to detect even small quantities of the grosser impurities, and is no less delicately alive to the slightest variations in color and smell. Should a specimen appear adulterated, it is at once set aside for the opium examiner, who reports specially concerning it to the agent, who, if the case is flagrant, confiscates and destroys it to the absolute loss of the cultivators. If the adulteration is only moderate, the price paid is but one half, or in lieu, a penalty is exacted, and the opium is employed to make the *lewah*, a paste used in forming the shells of the opium cakes. These precautions prevent the practice of adulteration in great measure, but a small number of confiscations being annually made. The nature of adulterations is very various. The grosser kind to increase the weight are mud, sand, powdered charcoal, soot, cow-dung, powdered poppy petals, and powdered seeds of various plants. All these substances are easily discovered by maceration in water. Flour is a very favorite sophistication, but opium so adulterated becomes sour, and its fracture and consistence much altered. The iodine test easily detects it. The farina of boiled potato, as well as ghee and goor, (impure treacle,) are occasionally used, but the purkhea detects them by odor and consistence. Besides these, various vegetable juices, extracts, pulps, and coloring matters, are occasionally mixed with the opium; such as the inspissated juice of the prickly pear, (Cactus dilenii,) extracts of the

tobacco plant, the stramonium and the Indian hemp, &c.; gummy exudations are used, the pulps of tamarind and of the bale fruit (ægle marmelos) are employed, whilst catechu, turmeric, and the flowers of the mowha tree (Bassia latifolia) are added to impart color.

The complex constitution of opium precludes the idea of a single test for revealing its purity; *morphiometry*, though the most accurate, is too tedious to be resorted to as a general rule; moreover, the commercial criteria of color, odor and texture, are considered more important than narcotic strength by the dealers, and excellent opium is sometimes condemned, when from some fault in preparing, it merely lacks those sensible qualities. Such opium is used in making *lewah*, and the cultivator is fined. The color of well-prepared opium is a deep dull brown when viewed in mass, which becomes a bright chestnut brown when a small portion of the drug is spread in a thin layer on a white surface; it adheres to the finger, may be drawn out to a moderate extent, and breaks with a ragged fracture; the presence of much pussewah renders it glutinous and more ductile.

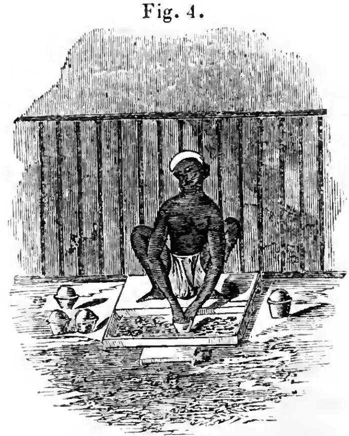
Its smell is perfectly *sui generis* and not unpleasant, and in the recent drug somewhat fruity. It breaks down readily in cold water in curdy flakes, which gradually subside, leaving a deep brownish-yellow colored supernatant liquid. When malaxated under water, though first adhering to the fingers, it soon separates, whilst if gum, or the juice of the Ficus Indica be present, it adheres strongly. Diacetate of lead added to the clear infusion separates an abundant flocculent precipitate of meconate of lead. Ammonia throws down a similarly abundant precipitate composed of resin and the alkaloids which speedily becomes black by exposure. The tinctures of iodine and sesquichloride of iron each precipitate the infusion brick red. These tests are applied in a few moments, and the comparative bulk of the precipitate enables the examiner to form a rude estimate of the value of the specimens, especially when adulterations have been practised. A solution of gelatin, and alcohol for the precipitation of tannin and gum, are the only other chemical tests resorted to.

After having been duly weighed in store, the opium receives but little treatment in the factory. It is kept in large wooden boxes capable of containing about 10 cwt. each, in which it

is (if below the manufacturing standard) occasionally stirred up from the bottom until it has acquired the necessary consistence. Whilst exposed in these boxes it soon becomes covered with a thin blackish crust (ulmin,) and deepens in color. Should the consistence be very low, it is put in shallow wooden vessels, and turned up frequently until it approximates 70 per cent. From the general store or malkhana, the drug is exported daily in quantities equalling 179 cwt., for being manufactured into balls or "*cakes*" as they are termed in the department. The officers aim at getting the opium at or very near the standard for exportation; and in case it should be too concentrated, send separately a portion of opium of low consistence.

Before the process of caking, the opium is removed from the boxes, having been previously assayed to determine its consistence etc., when it is again removed to large wooden vats 20 feet long, 3½ feet wide, and 1¼ feet deep, situated in the caking room. In these vats it undergoes a thorough kneading by men who wade knee deep through the opium from one end of the vats to the other, until their contents appear to be of uniform consistence. Two specimens from each vat are assayed, and if of the proper factory standard, caking immediately commences.

Fig. 4.



The process of opium cake making.

Down either side of the room in which the vats are placed, the cake makers are ranged, numbering usually about 110 individuals; each man being seated on a wooden stand, and furnished with a brass cup, forming the half of a hollow sphere, and with another tin vessel graduated to hold a certain quantity. On the previous evening the leaves requisite for forming the shells of the cakes have been weighed out, and tied in bundles of a fixed weight, and have been damped to render them supple. Down the centre of the room small scales are arranged for weighing the quantity of opium for each cake separately, and beside the scales are boxes

filled with *lewah* for the agglutination of the leaves, which form the shells of the cakes. In preparing the lewah, all the inferior opium and the pussewah are used, together with a considerable portion of good opium. These are broken down in the washings of the various vessels that have contained opium, and a semi-fluid paste formed of such consistence that 100 grains will yield 53 grains of residue by evaporation to dryness.

Matters being thus arranged, the cake maker having received from the lewah box a certain measure of the paste, commences to rapidly form within the brass cup the lower segment of the shell with the leaves at his side, pasting leaf over leaf until the thickness of half an inch is obtained, allowing a portion of the external leaves to hang down over the sides of the cup. A boy is in waiting with the opium to be put into the cake, which he has just brought from the scales, and which he throws into the shell. The cake maker, holding the opium away from the sides of the shell with the left hand, then tucks in around the side, leaf after leaf, well smeared with lewah, imbricating one over the other until he has completed the entire circle; the loose ends of the leaves are now tightly drawn up and, the opium well compressed in its leafy bag.

The opening at the top is then speedily closed by applying leaf after leaf, and finally a single leaf, well pasted, is applied to the entire top, and completes the cake. As thus formed the well finished cake is a regular sphere about the size of a 24lb. shot. It is now rolled in poppy trash, is placed in an earthen cup of the same size and shape as the brass cup, and in this way exposed out of doors to the direct influence of the sun during three days, frequently turned and examined, and if it should become distended and puffy, it is torn open, the gas liberated and again tightly closed.

On the third evening, still contained in the cup, the cakes are placed on frames of open battens, so as to allow a free circulation of air. A single man will on the average make 70 cakes a day, but occasionally 90 to 100 are turned out between 9 o'clock A. M. and 3 o'clock P. M. The daily production in the factory during the season is 6500 to 7000 cakes, and during the present season, (1850) 426,800 have been made.

By the end of July, the manufacturing is finished, but much attention has to be given to the cakes, by turning them in their cups, and removing mildew as it collects by rolling them in poppy trash. When the shells prove defective they are strengthened by additional leaves.

The following is the regulated composition of the cakes by weight: standard opium, 1 seer 10 chks.; standard opium converted into lewah, 4 chks.; leaves, 5½ chks.; total, 2 seers 3½ chks. By October the cakes, having become dry to the touch and quite solid, are packed in chests, furnished with a double tier of wood partitions, each presenting 20 squares. In these, the cakes are packed securely, surrounded by dry poppy trash. The shell of the opium cake, apparently so fragile, acquires by time great solidity and strength, especially after the moisture of the interior ceases to pass outward and dampen it.

The above described process of manufacture applies to opium put up for the China market, and it includes the great bulk of the production. The drug intended for home consumption is differently treated. It is called *abkaree* opium. The opium is exposed to the sun until it acquires the consistence of 90 per cent., and has the consistence and firmness of wax. It is then made into rectangular brick shaped masses of one *seer* (2lbs.) each, which are separately wrapped in oiled Nepaul paper, and packed in boxes furnished with compartments for their reception. Abkaree opium has not the powerful aroma of the ball of opium, but it is more powerful, and more easily packed.

When the opium season is concluded, the magistrate of Ghazeepore selects six cakes promiscuously from the provision, for examination and analysis by the opium examiners of Calcutta, the Behar agency, and the Benares agency, who ascertain the following points, viz. 1st. The gross weight of the cake. 2d. The weight of the shell separated from its contents. 3d. The weight of the contents. 4th. The condition of the shell. 5th. Physical character of the drug. 6th. Its consistence. 7th. Its yield of extract to cold distilled water. 8th. The quantity of morphia present. 9th. The quantity of narcotina. The following table exhibits the chemical results of four seasons, two cakes of each season being examined. The reader may draw the average.

Season.	Percent of Dry Opium	Percent. yield to cold water.	Pecent. of Morphia.	Percent. of Narcotina.
1845–46	73 and 75	52.33 and 50.26	2.76 and 2.30	5.33 and 5.20
1846–47	72 " 72	43.25 " 42.25	2.46 " 2.30	4.30 " 4.75
1847–48	71 " 70	44.43 " 39.26	2.23 " 2.17	5.66 " 5.70
1848–49	75·5 75.5	47.37 " 48.62	2.75 " 3.67	3.85 " 4.27

The chief chemical difference between Bengal and Turkey opium, is the large proportion of narcotina in the former, compared with the morphia, which the table shows to be constant in all seasons. Does the treatment of the juice during its preparation influence the amount and proportion of the alkaloids? In Turkey the juice is beaten up with saliva, in Malwa it is immersed in linseed oil as collected, whilst in Bengal it is merely dried in the shade, the watery part being drained off.

The following results I obtained from the analysis of recent juice collected in February, 1850, and from which none of the pussewah was separated.

I. Analysis of 2000 grains of juice, on the day of collection;

Morphia, ...	11.1 grains.
Narcotina, ...	32.7 "
Other matters soluble in alcohol, codeia, narceia, meconic acid, resin, etc., ...	521.0 "
Dry marc, insoluble in alcohol, lignin, caoutchouc, etc.	225.2 "
Water and volatile matter separable at heat of 200° F.	1210.0 "
Total,	2000.0

II. In the following experiment, the juice instead of being analysed at once, was exposed in a capsule at 200° F., until it reached about the factory consistence, and of this 1000 grains was taken.

Morphia, ...	24.9 grains.
Narcotina, ...	30.9 "
Other matters soluble in alcohol, codeia, narceia, meconic acid, resin, etc., ...	546.7 "
Dry marc insoluble in alcohol, lignin, caoutchouc, etc.	215.0 "
Water and volatile matter separable at 200° F., .	182.5 "
Total,	1000.0

III. Juice collected on the 23d of February, was exposed in a

capsule till the 7th of May, with occasional stirring, when it had acquired the consistence of 90.3 per cent., and 1000 parts was then analysed.

Morphia, ...	26.1	grains.
Narcotina, ... , .	32.8	"
Other matters soluble in alcohol, codeia, narceia, meconic acid, resin, etc., ...	630.4	"
Dry marc insoluble in alcohol, lignin, caoutchouc,	213.7	"
Water and volatile matter separable at 200° F., .	97.0	"
Total,	1000.0	"

The following table represents the results of the above analyses rendered parallel by reducing the products examined to the same state of dryness by calculation.

	I.	II.	III.
Morphia, ...	1.405	3.061	2.890
Narcotina, ...	4.012	3.795	3.632
Matters soluble in alcohol, . .	65.949	66.874	69.811
Dry marc insoluble in alcohol,	28.506	26.301	23.665
Total,	99.872	100.031	99.998

From these experiments it would appear that the unexposed juice yields less morphia, and more narcotina, than that which has been inspissated. The question naturally suggests itself, does narcotina under the influence of the exposure of drying or evaporation, by losing a portion of its elements, become changed into morphia? The proposition is a mere speculation, which could only be satisfactorily demonstrated by a careful set of minute experiments made during all stages of the process, from the extraction of the juice, to the completion of the opium.

I have already spoken of pussewah, and now propose to treat of it more fully. It is the drainings from the recent coagulated juice, and is brought to the factory in all degrees of consistence, from a thin fluid to that of thick treacle. Recently collected, it is a dark fluid resembling strong infusion of coffee, with a peculiar smell. It reddens litmus paper strongly; a solution of diacetate of lead and lime water both precipitate it copiously, as also does ammonia. Copious dilution with water also occasions a deep brown precipi-

tate. Recently collected, its sp. grav. is 1.120 at 83° F., and 100 grains yielded 30 per cent. of solid matter, somewhat like burgundy pitch in odor. Deprived of one third of its weight by evaporation, it has the consistence of treacle, and when perfectly dried it has a resinous fracture, and is perfectly solid. It is, however, hygrometric, and in the damp season becomes soft like cobler's wax. Pussewah, as might be supposed contains some of the most valuable constituents of opium; its principal components being meconic acid, resin, morphia and narcotina.. From 500 grains of pussewah, containing 88.9 grains of residue, I extracted 12 grs. of pure narcotina, with but a trace of morphia. In a second specimen, affording 85.5 grs., on evaporation I found 10.6 grs. morphia, and 16.9 grains narcotina. The production of pussewah compared with that of opium in the Benares agency, is as 1 to 182—and it is all used in making the lewah or paste for the shells.

Among the thousands of individuals, cultivators and employés, with whom the factory is filled during the opium season, no complaints are ever heard of injurious effects resulting from the influence of the drug. Casual visitors sometimes are affected with headache, but the European officers who pass the greater part of the day with the mercury at 95° to 105° F. among tons of the drug, never experience any bad effects from it. The native purkhea sits nine hours daily, with his hand and arm immersed nearly the whole time in the drug, which he is constantly smelling, and yet feels no inconvenience. He has informed me that at the commencement of the season he usually experiences a sensation of numbness in the fingers, most probably attributed to the local fatigue, rather than to the drug. The men who wade knee-deep through the opium in the caking vats for several hours, and afterwards stand in it during the rest of the day, serving it out by *armsful*, complain of drowsiness toward evening, and are overpowered by sleep early in the evening, but not of any unpleasant or injurious effects.

From these and other examples, it is apparent that the health of the workmen is not injured by the business, and that, in the case of *vat-treaders*, the effects are more through the lungs than by the skin.

[Dr. Eatwell concludes his paper with an apology for the opium trade to China, and endeavors to show that its effects are not so pernicious as has

been asserted, and are less debasing than the European practice of excess in alcohol, and its moderate use not more injurious than is the moderate use of alcoholic liquors. But as this subject is more interesting to those who assume the terrible responsibility of administering, wholesale, to the depraved appetite of a nation, despite the opposition of its rulers, we will not occupy space with the arguments, however plausible. The reader is referred to a paper on the subject of India opium, by Prof. Carson, vol. xxi page 195, of this Journal, in which he gives a description and some chemical results, with several specimens of India opium, brought from China by Dr. Ruschenberger, U S. N.—ED. AM. JOUR. PHARMACY.]

THE PHARMACEUTICAL CONVENTION OF 1852.

By EDWARD PARRISH.

Having some months since proposed, in the Philadelphia College of Pharmacy, bringing together for mutual advantage and encouragement, the scattered elements of what may be called the *nascent* profession of pharmacy, I read with interest the proceedings of the recent convention of Pharmaceutists in New York, calling a National Convention in this city next fall. These proceedings, published in the last number of this Journal, and so forcibly urged upon the attention of its readers under the editorial head, are worthy to be kept before the pharmaceutical public until the time of the proposed convention; and as the purpose of the present article is to notice some of their details, and to offer some suggestions in relation to them, the Resolutions adopted in New York are here inserted.

" *Whereas,* The advancement of the true interests of the great body of pharmaceutical practitioners in all sections of our country is a subject worthy of earnest consideration; and *whereas*, pharmaceutists, in their intercourse among themselves, with physicians and the public, should be governed by a code of ethics calculated to elevate the standard and improve the practice of their art; and *whereas,* the means of a regular pharmaceutical education should be offered to the rising pharmaceutists by the establishment of Schools of Pharmacy in suitable locations; and *whereas,* it is greatly to be desired that the united action of the profession should be directed to the accomplishment of these objects; therefore,

" *Resolved,* That in the opinion of this convention much good will result from a more extended intercourse between the pharmaceutists of the several

sections of the Union, by which their customs and practice may be assimilated; that pharmaceutists would promote their individual interests, and advance their professional standing, by forming associations for mutual protection, and the education of their assistants when such association have become sufficiently matured; and that, in view of these important ends, it is further

"*Resolved*, That a Convention be called, consisting of three delegates each, from incorporated and unincorporated pharmaceutical societies, to meet at Philadelphia on the first Wednesday in October, 1852, when all the important questions bearing on the profession may be considered, and measures adopted for the organization of a National Association, to meet every year."

The plan of organization here proposed is perhaps the best that could have been adopted, under all the circumstances, and yet I confess to some regrets that no way opened by which all pharmaceutists who feel interested in the elevation of their profession, and the promotion of pharmaceutical reform, could partake in the deliberations of the Convention. If it were designed to legislate for a profession of pharmacy fully organized throughout the country, I could more willingly acquiesce in the policy of requiring of every member a certificate of his appointment as the representative of some local organization. But the actual condition of the drug trade, and the so called profession of pharmacy, is widely different. It is only in the large cities that they are organized at all.

As far as educated apothecaries have penetrated in the great west, and in the more Southern states they are isolated, scattered here and there, with very little concert of action, and no definite organization; they are, for the most part, surrounded by ignorance, overrun with quackery, and scattered singly among the legion of empyrics, they have scarcely strength to stem the current which sets so fatally downwards. Now for the encouragement and strengthening of such, the proposed Convention is eminently calculated, and by associating them in Convention with the apothecaries of New York, Philadelphia, Baltimore, Boston, Cincinnati and other cities, in which the benefits of association are already more or less fully attained, the strong tie of professional and fraternal interest already measurably created by a common object and kindred pursuits, may be widened and strengthened, a renewed interest created in our art, and a higher appreciation of its dignity and importance as a branch of medical science.

So strongly have I been impressed with the importance of an active sympathy with and for this class, that I believe much of the usefulness of the proposed Convention depends upon their being represented; and as a Philadelphia apothecary, speaking to a certain extent, at least, for the profession in this city, I would invite all who feel an interest in the objects of the Convention, to visit our city at the time, whether armed with credentials or coming in the simple character of pharmaceutists, desirous of elevating the standard of their profession.

Though not included in the invitation of the Convention held in New York, they will find a hearty welcome to the Quaker city; and there can be little doubt that besides being entitled to attend the sittings of the Convention, opportunity will be offered to communicate, officially or otherwise, their views and feelings to it. These remarks are made with no design to cavil at the action of the Convention in New York, which, by the delegate system, has wisely provided against any undue influence on the action of the Convention, arising from local causes. The sole object I have in view, is to encourage some to attend who might impart and derive advantage from the meeting, but who, because they must needs be pioneers in their several localities, and as yet lack the ability to draw together suitable organizations, cannot come as delegates.

I repeat, let all come—there is not so much material in the pharmaceutical ranks, that the Convention can afford to lose the counsels of any who have the cause at heart, and have the ability to promote it.

Besides the isolated class to which I have referred, there are in most of the larger towns throughout the country small numbers of Pharmaceutists, some of whom are more or less interested in the progress of their profession, who it is designed by the Convention in New York to organize into unincorporated Societies, to be represented in the National Convention. Upon the carrying out of this plan, depends, to a great extent, the national character of the Convention, and to a certain extent its usefulness, and yet it would be a cause of regret if, by precipitous or unadvised action, any of these associations should be so organized as to be incapable of subserving any permanently useful purpose.

It will be obvious at once that much of their future success and influence will depend upon the course taken at the very outset.

Grave and difficult questions which experience has proved are of the highest importance, must be met perhaps at their very first meeting. What shall be the qualifications for membership? Shall the number of members, necessarily small, be diminished by exclusive regulations, or, on the other hand, shall the enlightened and conscientious apothecary join hands with the ignorant empyric? Shall ill-gotten wealth and undeserved influence in the community weigh against the true qualifications of an educated, honorable and high-minded apothecary?

These and numerous other questions of equal import, especially pertaining to a society which is designed to form an integral part of a national organization to "be governed by a code of ethics calculated to elevate the standard and improve the practice" of Pharmacy, must be met and settled a priori.

Then will come the jealousies that are almost inseparable from trade, and which it is one of the chief objects of the proposed organization to break up. At the very commencement of any pharmaceutical association, some ground of intercourse must be agreed upon among the members, which, while it shall allow free scope to an honorable and manly competition, shall destroy every germ of this pestiferous plant.

Under such circumstances, will it not occur to every Pharmaceutist that great caution should be observed in the preliminary steps, looking to permanent local organizations, and that they should not be consummated till after the proposed Convention.

The delegates to such Convention will probably return home with a knowledge of the mode in which the oldest and most successful existing organizations are founded—with a just appreciation of the ethical relations which the members bear to each other, and to the medical profession—of the received opinions in regard to quackery, open and disguised—of the duties and responsibilities of druggists and apothecaries in regard to the education of candidates for the profession placed under their care—of the difficulties in the way of giving them such an education, and the best means of overcoming them, and with such enlightened views of the duty and destiny of the profession at large as would enable them to organize, on a sure foundation, auxiliary associations which would be permanently useful in promoting the great objects of Pharmaceutical reform.

OBSERVATIONS ON CHLORIDE OF IRON AND SODIUM, AND OTHER DOUBLE SALTS OF IRON.

By Frederic A. Cochran, of Baltimore, Maryland.

Some time during February 1851, while preparing chloride of iron and ammonia, it appeared to me that chloride of iron and sodium might be a valuable salt of iron ; and not being aware that such a combination had been formed, I consulted the various works on Materia Medica and Pharmacy, but was unable to find any account of it. Therefore, I prepared about half a pound by dissolving the common carbonate of iron (peroxide) in hydrochloric acid, and adding to it a cold solution of crystallized carbonate of soda, so long as the peroxide of iron which it precipitated was readily re-dissolved. By this means I formed a very dark red nearly neutral solution of chloride of iron and sodium, almost tasteless, and only slightly astringent. This solution in a porcelain dish was placed on a boiling water bath to evaporate, and about the time for a pellicle to form, believing that the salt was amorphous, I was somewhat surprised to see all the solution converted into a magma possessing the common characteristics of hydrated peroxide of iron. It seemed to be decomposed, but as it was readily and entirely soluble in cold water, the evaporation was continued while its strong affinity for water caused it to dry slowly and in masses, which, however, when dry, were easily reduced to powder, and not sensibly deliquescent in the air. This powder very nearly resembled peroxide of iron in appearance, was slightly saline and styptic to the taste, and in small quantity was entirely soluble in cold water, forming a solution of a clear claret color. About an ounce of this powder was loosely wrapped in a single piece of thin porous paper, and kept exposed in the air during "all the seasons and their change," and the paper is now only slightly stained yellow, and the powder, as if having absorbed a little moisture, is in dry pulverulent lumps. This powder is not quite so soluble as it was a year ago when it was made, and its solution does not now indicate the presence of iron with a solution of ferrocyanuret of potassium as it did slightly at that time.

Reflection and experiment have induced me to believe that it

may be stated as a general truth, to which there may not be an exception, that there cannot be formed a neutral, simple and soluble salt of the sesquioxide of iron. The perchloride of iron, the nitrate and sulphate of the peroxide, are soluble, and acid and the vegetable acids form similar salts with the sesquioxide of iron. Therefore the excess of acid of any of these soluble salts may be neutralized with any of the alkalies, potassa, soda or ammonia, and form double salts. But in the preparation of these double salts, it is very important first to form the salt of iron by saturating the acid with sesquioxide of iron, and neutralizing the excess of acid with an alkali, because almost all the acids have a less affinity for the metals than for the alkalies, and if the affinity be satisfied by the union of the acid and alkali, and the alkali have an affinity for only one equivalent of the acid, as is the case in chloride of sodium and chloride of ammonium, it is impossible to form double salts by adding any oxide of iron or solution of iron in the same acid to either of these salts. But if the alkali have a strong affinity for more than one equivalent of the acid, then the excess of the acid combined with the alkali may be neutralized, as in the preparations of tartrate of potassa and iron, tartrate of potassa and antimony, and tartrate of potassa and soda.

Thus tracing the analogy which seems to be almost parallel in these preparations, I have chemically combined chloride of iron with potassium and ammonium separately, and found two distinct double salts. But of these double salts, chloride of iron and sodium seems to be the most important. I have repeatedly tried in a variety of ways to form this double salt, by mixing and evaporating at different temperatures solutions separately formed of perchloride of iron and chloride of sodium, but the result has been uniformly crystallized chloride of sodium in a solution of perchloride of iron. I have separated the former from the latter almost pure, by simply washing it with water. These experiments carefully performed, convinced me that I could only prepare the double chloride of iron and sodium by one process, viz: preparing the perchloride of iron and neutralizing the excess of acid with caustic or carbonated soda. I prefer the following formula:

Take of	Commercial Carbonate of Iron,	8 ounces troy.
"	Hydrochloric Acid, pure, sp. gr. 1.18,	24 fluid ounces.
"	Bicarbonate of Soda, - - -	18 ounces troy.
"	Boiling water, - -	72 fluid ounces.

Dissolve the sesquioxide of iron in the hydrochloric acid in a porcelain dish without heat, and the bicarbonate of soda separately in the boiling water, and when the solution shall have cooled, add it gradually to the solution of iron, stirring after each addition, until the peroxide of iron which it precipitates shall cease to be readily re-dissolved. As this solution filters very slowly, it may be decanted after standing an hour. It should then be evaporated at a temperature not exceeding 150° F., and the residue reduced to powder and kept in glass stoppered bottles. If the bicarbonate of soda contain 40 per cent. of soda the quantity is only enough.

Prepared in this manner ten grains of the dry powder dissolved entirely in an ounce of pure water, and formed a permanent pale red solution nearly tasteless, from which the salt was obtained unchanged by evaporation. But if twenty grains or a larger quantity be added to an ounce of water it forms a semi-solution, in which after a day or two, peroxide of iron sinks, leaving a clear nearly colorless supernatant solution of chloride of sodium. Boiling water produces the same change in a very short time. It is insoluble in alcohol and ether, and incompatible with the astringent vegetable tinctures, infusions and extracts, and the caustic alkalies. Considered anhydrous it consists of one equivalent of chloride of iron 63.42, and one equivalent of chloride of sodium 58.72. Its equivalent is therefore 122.14. It contains 33 per cent. of peroxide of iron.*

*Gmelin's Handbook, (Vol. V, page 268,) under the head, "Carbonate of Ferric Oxide and Potash," says, "when a ferric salt is supersaturated with strong carbonate of potash, the precipitated ferric hydrate is redissolved and forms a blood red solution. This solution is decomposed with precipitation of ferric hydrate, both by heat and by dilution with water or solution of caustic potash. Freshly precipitated ferric hydrate is not soluble in strong carbonate of potash, so that the presence of the potash salt formed at the same time [chloride of poatssium] appears to be necessary to the solution." A corresponding soda salt is noticed at page 272, carbonate of soda being used in lieu of the potash carbonate.

In bringing forward these quotations, it is with a view of throwing some light on the composition of Mr. Cochran's salt of chlorine, sodium and iron, as he does not appear to have made an analysis, but assumes it to be an anhydrous chloride of iron and sodium from the ingredients employed to form it. The numbers used by Mr. Cochran as the equivalents for chloride of iron, indicate the proto-chloride, whilst he considers that the

I have recently prepared syrup of chloride of iron and sodium. It is a permanent and very pleasant preparation, almost without any chalybeate taste; and it has been used and approved by many of the most experienced and eminent physicians of this city. The formula is as follows:

Take of	Commercial Carb. Iron,	- -	one ounce troy.
"	Hydrochloric Acid, pure,	sp. gr. 1.18	3 fluid ounces.
"	Bicarbonate of Soda,	- - -	18 drachms.
"	Boiling water,	- - -	9 fluid ounces.
"	Fine powdered Sugar,	- -	24 ounces troy.

Prepare the solution of chloride of iron and soda as directed

perchloride exists in the compound. Assuming this to be an error of the pen, and that he intended to express half an equivalent of sesqui-chloride, ($FeCl_{1\frac{1}{2}}$) united to one eq. of chloride of sodium, the proportion of the elements should be 90 of chlorine, 23.3 sodium and 28 iron, whereas the actual relation and amounts of these elements in the materials used in the formula, (admitting the subcarbonate of iron to be hydrated sesqui-oxide, the bicarbonate of soda to contain its full proportion of carbonic acid, and the muriatic acid (sp. gr. 1.18) to contain 35 per cent. of chlorine) are 4363 grs. of chlorine, 2380 grs. of sodium, and 2194 grs. of iron. Now 2194 grs. of iron require 4231 grs. of chlorine to convert it into sesqui-chloride, which is the first step in the process, leaving but 132 grs. of chlorine to combine with the sodium which actually requires 3680 grs. to convert it into chloride of sodium. It must be apparent, if these numbers are nearly correct, that the conditions are present for the production of a compound analogous to that described above by Gmelin. As there is no carbonate of soda present in the solution, the soda must have combined with a full equivalent of chlorine, displacing a large portion of the iron from combination, which by uniting with the oxygen of the soda becomes sesqui-oxide, and which, in its nascent state, is redissolved by the sesqui-chloride of iron in the presence of the chloride of sodium. It is, therefore, quite probable that Mr. Cochran's preparation consists of sesqui-chloride of iron and sesqui-oxide of iron, united as oxychloride, combined with chloride of sodium; a supposition rendered extremely probable by the effect of heat. These remarks will apply to the other two compounds made in the same way, with potassa and ammonia. We have prepared the solution by the directions of Mr. C., and find that it is coagulated by heat and by caustic potassa. These suggestions are made entirely in reference to the chemical relations of the salt. As a new pharmaceutical preparation, it promises to be a valuable addition to the therapeutic agents of this class, and, as the author says, presents some points peculiarly desirable in a ferruginous tonic.—Ed. Am. Jour. Pharm.

above. Mix it with the sugar in a bottle, and form syrup without heat by shaking it at intervals. This syrup ought to measure twenty seven ounces, and yield seventeen grains of peroxide of iron to the ounce. One ounce of this syrup evaporated yielded a black residue, deliquescent in the air, from the solution of which, sesquioxide of iron was not thrown down by the caustic alkalies; but the solution was changed to its original new color.

Considering the great astringency of the perchloride, and the exceedingly unpleasant taste of almost all the soluble salts of iron, it may be fairly inferred that the double chloride of iron and sodium, possesses properties at least in point of taste, that may prove to be of some practical importance alike to the profession and to the people. The fact that iron is a powerful tonic, presupposes general debility to be the condition of the patient indicating its use, and in these cases the enfeebled condition of the stomach seems to require the mildest and least astringent chalybeate, that it may be absorbed and produce its constitutional invigorative effect.

Professor Wood (U. S. D. 9th edit. p. 999,) states that perchloride of iron "is one of the most active and certain preparations of iron, usually acceptable to the stomach, and much employed for all the purposes to which the chalybeates are generally applied;" and as perchloride of iron is so very styptic, it would seem to be almost impossible for it to be absorbed, and as chloride of sodium is daily taken into the stomach in the food, it may be possible that a chemico-vital action forms chloride of iron and sodium when perchloride of iron is given.

Chloride of Iron and Ammonium.

It is very well known that this compound is only a mixture as prepared according to the Pharmacopœias. Prof. Pereira (Elements of Materia Medica, &c., ed. 1852, p. 740) states, "by evaporating the solution (of perchloride of iron) with a solution of hydrochlorate of ammonia, we obtain a mixture of these bodies. There is no reason to believe that any chemical combination takes place." Also at p. 440, are these words: "Yellow or brownish streaks or bands are frequently absorbed in the cakes of sal-ammoniac. These are ascribed by the manufacturers to the neglect

of the workmen, who, falling asleep during the night, allow the fire to go down considerably, and then suddenly raise the heat, by which chloride of iron is sublimed in combination with sal-ammoniac. For several years I have been accustomed to show in the lecture room, that a solution of these yellow bands in water gives no traces of iron on the addition of ferrocyanide of potassium, until a few drops of nitric acid be added, when a copious blue precipitate is formed; and I therefore inferred that this yellow matter was a double chloride of iron and ammonium. My opinion has been fully confirmed by the experiments of Dr. G. H. Jackson."

I have formed a double salt by the following formula:

Take of	Peroxide of Iron, - - -	1 ounce troy.
"	Hydrochloric Acid, pure, sp. gr. 1.18,	3 fluid ounces.
"	Carbonate of Ammonia, - -	1½ ounces troy.
"	Water, - - - - - -	6 fluid ounces.

Prepare the perchloride of iron as directed for chloride of iron and sodium, and dissolve the carbonate of ammonia in the water; then neutralize the excess of acid of the perchloride with the solution of carbonate of ammonia, and evaporate at a temperature of 150° F., and the residue will be a powder resembling the double chloride of iron and sodium. It is not more soluble, but forms a darker solution, and if exposed to the air till the slight excess of acid evaporates, it is not precipitated or changed by ferrocyanide of potassium.

ON NICOTINE.

[*Extracted from a paper read before the National Academy of Medicine.*]

By M. Orfila.

Pure Nicotine may be characterized as easily as a Poison derived from the Mineral Kingdom.—Nicotine, discovered in 1809 by the illustrious Vauquelin, was studied in 1828 by Messrs. Posselt and Reimann, who found it in different species of nicotiana, as macrophylla, rustica, and glutinosa. Messrs. Boutron Charlard and Henry described some of its properties in 1836. Havana

tobacco contains two per cent., that of Maryland 2.3, that of Virginia 6.9, that of Alsace 3.2, that of Pas-de-Calais 4.9, that of the Nord 6.6, and that of the Lot 8. It is classed among the *natural volatile* vegetable alkalis, which are only three in number, namely, *conicine*, *theobromine*, and *nicotine*. This last is entirely composed of hydrogen, carbon, and nitrogen. It may be represented as a compound of one equivalent of ammonia (NH_3) and of one of a hydro-carbon containing four equivalents of hydrogen and ten of carbon (H_4C_{10}). It is now obtained by a much more simple process than was formerly adopted, which consists in passing the vapor of tobacco into water acidulated with sulphuric acid. Sulphate of nicotine is thus speedily produced, and this has to be decomposed by a strong alkali. It is then only necessary to apply sufficient heat to volatilize the nicotine. This mode of preparation indicates that smokers in respiring the smoke of tobacco introduce into their bodies a certain quantity of the vapor of nicotine.

Characters of pure Nicotine.—It is in the form of an oleaginous, transparent, colorless, tolerably fluid, anhydrous liquid, of the density of 1.048, becoming slightly yellow with keeping, and tending to become brown and thick from contact with the air from which it absorbs oxygen; its acrid odor resembles but slightly that of tobacco; its taste is very burning. It volatilizes at 77° F., and leaves a carbonaceous residue. The vapor which rises presents such a powerful smell of tobacco, and is so irritating, that it is difficult to breathe in a room in which one drop of it has been spilt. If this vapor be approached with a lighted taper, it burns with a white smoky flame, and leaves a carbonaceous residue as an essential oil would do. It *strongly blues* reddened litmus paper. *It is very soluble in water*, in alcohol, and in fat oils, as also in *ether*, which easily separates it from an aqueous solution. The great solubility of nicotine in both water and ether forms an important fact in its chemical history, as the greater number of vegetable alkalis, not to say all, if they dissolve easily in one of these liquids, are not readily soluble in the other.

Nicotine combines directly with acids, disengaging heat. Concentrated pure sulphuric acid, without heat, produces with it a wine-red color; on the application of heat to this it becomes thick, and acquires the color of the dregs of wine; if it be boiled it

blackens and disengages sulphurous acid. With cold hydrochloric acid it disengages white vapors as ammonia does; if the mixture be heated it acquires a violet-color, the intensity of which increases with prolonged ebullition. Nitric acid, aided with a little heat, imparts to it an orange-yellow color, and white vapors of nitric acid are first given off, then red vapors of hyponitrous acid. If it be further heated the liquor becomes yellow, and by ebullition it acquires a red color resembling that of chloride of platinum. Prolonged ebullition gives a black mass. Heated with stearic acid it dissolves and forms a soap, which congeals on cooling, and is slightly soluble in water, and very soluble in heated ether. The simple salts of nicotine are deliquescent, and difficultly crystallizable. The double salts which it yields with the different metallic oxides crystallize better.

The aqueous solution of nicotine is colorless, transparent, and strongly alkaline. It acts like ammonia on several reagents; thus, it gives a white precipitate with bichloride of mercury, acetate of lead, protochloride and bichloride of tin; a canary yellow precipitate with chloride of platinum, which precipitate is soluble in water; a white precipitate with salts of zinc, which is soluble in excess of nicotine; a blue precipitate with acetate of copper. This precipitate is gelatinous, and soluble in excess of nicotine, forming a blue double acetate, similar to that formed by ammonia with the same salt. It gives an ochre-yellow precipitate with salts of the sesquioxide of iron, insoluble in excess of nicotine. With sulphate of protoxide of maganese it gives a white precipitate of oxide, which speedily becomes brown by contact with the oxygen of the air. It separates the green sesquioxide from the salts of chromium. The red permanganate of potash is instantly decolorized by nicotine, as by ammonia, although this latter alkali acts more slowly and must be used in larger proportion.

The following reactions may serve to distinguish the aqueous solutions of nicotine from ammonia. Chloride of gold yields a reddish yellow precipitate, *very soluble in an excess of nicotine.* Chloride of cobalt yields a blue precipitate, which changes to green; the oxide thus formed does not readily dissolve in excess of nicotine, whilst ammonia dissolves the green precipitate and forms a red solution. Aqueous solution of iodine gives a yellow

precipitate with solution of nicotine, as chloride of platinum would do; with an excess of nicotine it acquires a straw color, and it is decolorized by the action of heat. Ammonia, on the contrary, immediately decolorizes the aqueous solution of iodine without rendering it turbid. Pure tannic acid gives with nicotine an abundant white precipitate. Ammonia gives no precipitate, but imparts a red color.

It is interesting to compare the physical and chemical properties of nicotine with those of conicine.

Conicine is yellow; *its smell resembles that of the urine of the mouse*, and differs entirely from that of nicotine; it strongly blues reddened litmus paper. Added to water and shaken with it, it floats on the surface and is not readily dissolved. Ether dissolves it easily. When heated in a capsule it forms white vapors, *having a strong smell of celery mixed with that of the urine of the mouse.* Weak tincture of iodine yields a white precipitate, which acquires an olive color with excess of the tincture. Pure and concentrated sulphuric acid *does not alter it*; when the mixture is heated it acquires a greenish brown color, and if the heat be continued it becomes blood-red and afterwards black. Nitric acid imparts to it a *topaz color*, which is not changed by the action of heat. Hydrochloric acid yields white vapors as ammonia does, and renders it violet, especially when heated. Tannic acid gives a white precipitate, and chloride of platinum a yellow precipitate. The red permanganate of potash is immediately decolorized. Corrosive sublimate yields a white precipitate. Acetate of copper gives a gelatinous blue precipitate, less soluble in an excess of conicine than is that formed with nicotine. Chloride of cobalt behaves with it as it does with nicotine. Chloride of gold gives a light yellow precipitate. *Neutral acetate of lead does not give any precipitate;* neither does the subacetate. Chloride of zinc gives a white gelatinous precipitate soluble in excess of the conicine. Sulphate of sesquioxide of iron gives a yellow precipitate. The words in italics indicate the means of distinguishing conicine from nicotine.—*London Pharm. Journ.*

5. *Neutral proximate principles.* Styracin, piperin, naththalin, cholesterin, [and we may add cantharidin—Ed.] are very soluble; picrotoxin, slightly so; paraffin only when hot, separating as the liquid cools; whilst amygdaline, phloridzin, salicin, digitalin, cynisin, urea, hematin, gluten, sugar, &c., are insoluble.

6. *Organic acids.* Benzoic and hippuric acids are very soluble, tannic but slightly, and tartaric, citric, oxalic, and gallic acids not at all.

7. *Organic alkalies.* Quinia, veratria, emetia, and narcotina, [to which we may add, from the observations of others, nicotina, conia, and atropia,*—Ed.] are easily soluble, strychnia with less readiness, and appears to undergo a change in its morphic condition; brucia is also moderately soluble, but morphia and cinchonia are insoluble in this menstruum.

8. *Salts of organic acids.* Tartar emetic, citrate and lactate of iron, the acetates of soda and potassa, the valerinate of zinc, and acetate of lead, are all insoluble.

9. *Salts of organic bases.* Sulphate and muriate of strychnia are soluble, whilst sulphate and muriate of morphia, and sulphate of quinia, are insoluble.

10. *Haloid salts.* The iodide, bromide, chloride and ferrocyanuret of potassium, the chloride of sodium, and muriate of ammonia, the iodides of mercury and potassium, are all insoluble in chloroform, whilst corrosive sublimate dissolves with great readiness.

11. *Oxysalts.* The iodates, chlorates, nitrates, phosphates, sulphates, chromates, borates, arseniates, and alkaline hyposulphates, are completely insoluble, as also are nitrate of silver, sulphate of copper, and probably all the metallic oxysalts.

* In a note to his paper, M. Lepage calls in question the statement of M. Rabourdin, (see vol. xxiii, page 139, Amer. Jour. Pharm.) that chloroform will dissolve atropia, and remove it from solutions. We have tried M. Rabourdin's process with conia, and find that it dissolves it readily. The editor of the N. Y. Journal of Pharmacy, suggests that chloroform will preserve anatomical and pathological specimens, without change of color or apparently of texture. This probably applies to the muscular and gelatinous tissues, but specimens embracing adipose structure, would probably be altered.—Ed. Amer. Jour. Pharm.

The wide range of solvent power which the above facts indicate, promises that chloroform will prove a most valuable auxiliary to the analytical chemist, and especially in proximate analysis. A valuable pharmaceutical application may be made in the means it affords of readily separating resin of guaiac, from jalap resin, cinchonia from quinia, and narcotine from morphia.

M. Augendre, of Constantinople, found that milk mixed with one per cent. of chloroform, was preserved for a month in a corked bottle, from 10th of April to 12th of May unchanged, and could be boiled without coagulating.

ON TWO VARIETIES OF FALSE JALAP.

By John H. Currie.

Two different roots have for some time back been brought to the New York market for the purpose of adulterating or counterfeiting the various preparations of Jalap. They differ materially from the Mechoacan and other varieties of false Jalap which formerly existed in our markets, as described by Wood and Bache in the United States Dispensatory, while some of the pieces bear no slight resemblance to the true root. The specimens I have been able to procure are so imperfect, and so altered by the process of drying, that the botanists I have consulted are unable to give any information even as to the order to which they belong. I have not been able either to trace their commercial history, nor do I know how, under the present able administration of the law for the inspection of drugs, they have obtained admission to our port. The article or articles, since there are at least two of them, come done up in bales like those of the true Jalap, and are probably brought from the same port, Vera Cruz.

No. 1 appears to be the rhizome or underground stem of an exogenuous perennial herb, throwing up at one end each year one or more shoots, which, after flowering, die down to the ground. It comes in pieces varying in length from two to five inches, and in thickness from the third of an inch to three inches. In some

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of the pieces the root has apparently been split or cut lengthwise; in others, particularly in the large pieces, it has been sliced transversely like Colombo root. The pieces are somewhat twisted or contorted, corrugated longitudinally and externally, varying in color from a yellowish to a dark brown. The transverse sections appear as if the rhizome may have been broken in pieces at nodes from two to four inches distant from each other, and at which the stem was enlarged. Or the same appearance may have been caused by the rhizome having been cut into sections of various length; and the resinous juice exuding on the cut surfaces, has hindered them from contracting to the same extent as the intervening part of the root. On the cut or broken surfaces are seen concentric circles of woody fibres, the intervening parenchyma being contracted and depressed. The fresh broken surfaces of these pieces exhibit in a marked manner the concentric layers of woody fibres. The pieces that are cut longitudinally, on the other hand, are heavier than those just described, though their specific gravity is still not near so great as that of genuine Jalap. Their fracture is more uniform, of a greyish brown color, and highly resinous.

This variety of false Jalap, when exhausted with alcohol, the tincture thus obtained evaporated, and the residuum washed with water, yielded from $9\frac{1}{2}$ to $15\frac{1}{2}$ per cent. of resin, the average of ten experiments being 13 per cent. Its appearance was strikingly like that of Jalap resin. It had a slightly sweetish mucilaginous taste, leaving a little acridity, and the odor was faintly jalapine. It resembled Jalap resin in being slowly soluble in concentrated sulphuric acid, but unlike Jalap resin it was wholly soluble in ether. In a dose of ten grains it proved feebly purgative, causing only two or three moderate liquid stools. Its operation was unattended with griping or other unpleasant effect, except a slight feeling of nausea felt about half an hour after the extract had been swallowed, and continuing for some time.

This variety of false Jalap is probably used, when ground, for the purpose of mixing with and adulterating the powder of true Jalap, or is sold for it, or for the purpose of obtaining from it its resin or extract, which is sold as genuine resin or extract of Jalap. The powder strikingly resembles that of true Jalap, has

a faint odor of Jalap, but is destitute, to a great extent, of its flavor. The dust too, arising from it, is much less irritating to the air passages.

The second variety is a tuber possibly of an orchidate plant, a good deal resembling in shape, color and size, a butternut, (Juglans cinerea.) Externally it is black or nearly so, in some places shining as if varnished by some resinous exudation, but generally dull, marked by deep longitudinal cuts extending almost to the centre of the tubers; internally it is yellow or yellowish white, having a somewhat horny fracture, and marked in its transverse sections with dots, as if from sparse, delicate fibres. When first imported the root is comparatively soft, but becomes dry and brittle by keeping. Its odor resembles that of Jalap, and its taste is nauseous, sweetish, and mucilaginous.

This root contains no resin whatever. Treated with boiling water it yields a large amount (75 per cent.) of extract. This is soluble, to a great extent, likewise in alcohol. With iodine no blue color is produced.

The extract obtained from this drug appears, in ordinary doses, perfectly inert, five or ten grains producing, when swallowed, no effect whatever. Is this root employed for the purpose of obtaining its extract, and is this latter sold as genuine extract of Jalap?

Of the effect which frauds of this kind cannot fail to have on the practice of medicine it does not fall within my province to speak, but commercially its working is sufficiently obvious. One hundred pounds of Jalap at the market price, 60 cents per pound, will cost $60. In extracting this there will be about $5 worth of alcohol, making in all $65. There will be obtained forty pounds of extract, costing thus $1 62½ per pound.

One hundred pounds of false Jalap, No. 1, may be obtained for $20; admitting the alcohol to cost $5, it will make in all $25. This will produce thirty-six pounds of extract, costing rather less than 70 cents per pound.

One hundred pounds of variety No. 2 may be had for $20, and no alcohol is necessary in obtaining the extract. The yield being seventy-five pounds, the extract will cost rather less than twenty-seven cents per pound.—*N. Y. Journal of Pharmacy, Jan.* 1852.

COMPOUND FLUID EXTRACT OF SENNA AND DANDELION.

By Eugene Dupuy, Pharmaceutist, New York City.

Senna (officinal,)	two pounds.
Torrefied Dandelion Root, . . .	one pound.
Chamomile, ...	quarter of a pound.
Sugar, ...	twenty ounces.
Carbonate of Potash or Soda, . .	one ounce.
Oil of Gaultheria, ...	half a drachm.
Alcohol, ...	two ounces,
Water, ...	half a gallon.

Mix the dry plants, previously reduced to a coarse powder, with the water holding the alkaline carbonate in solution; let the mixture stand twelve hours; introduce it in a percolator, and gradually pour in water until a gallon of liquid shall have passed; evaporate it to twenty ounces by means of a water bath, then add the sugar, filter, and make the addition of the alcoholic solution of gaultheria when cold. By following this process, I believe that a kind of saponification takes place, which allows of the more ready solution of the active principle of the senna in the aqueous vehicle, probably because chlorophylle being united to a dried essential oil, participating in the properties of resins, is rendered soluble, and the extractive portion being denuded of its resinoid covering, is more readily extracted by the percolating liquid. I make use of a percolator possessed of a convenient hydraulic power; it has rendered readily, within thirty hours, a highly saturated liquid, containing in a gallon all the soluble principles of this extract. Ordinary percolators will answer also; but the ingredients needing to be more loosely packed, do not yield so fully or so readily. The addition of torrefied dandelion root is intended to give to this fluid extract some greater value on account of its peculiar action on the hepatic system. I employ in preference the German chamomile (Camomilla vulgaris,) because of its pleasant aroma and its carminative properties, joined to a bitter principle, which seems to increase the purgative effect of the senna.

This extract has become a favorite anti-bilious purgative with many of our practitioners, who, some of them at least, have used

it with success with children, who can take it readily, as well as for adults, where an anti-bilious purgative is desirable, seldom producing pain or nausea, and not liable to produce constipation.—*N. Y. Journal of Pharmacy, Jan.* 1852.

EXAMINATION OF THE SEEDS AND CAPSULES OF DIGITALIS PURPUREA.

By Dr. A. Buchner, Sen.

The author has examined the seed and capsules of *Digitalis purpurea.* The seed lost by drying at about 162° F., 9·26 per cent. of water. The capsules are very slightly hygroscopic, and lose scarcely 4 per cent. by drying. The author prepared extracts of the seed and of the capsules with ether and water, and examined them. The following are the results arrived at:

The seeds of *Digitalis purpurea* are preferable to the leaves, as they contain a larger amount of digitaline, together with a fat oil, are not so liable to be mistaken or collected at a wrong period, and are more easily dried and preserved without experiencing any alteration; in short, more dependence can be placed upon them.

The digitaline in the oily compound, which is easily prepared with ether from the seeds, merits every attention in a therapeutical respect, for the seed, or the oily digitaline compound from it, can be easily dispensed, and at a very moderate expense, in various forms, as emulsion, powder, pills, &c.

The seed-capsules and calyx of *Digitalis* likewise contains digitaline, but in proportionately far smaller quantity; so that the tannate of digitaline, which can be prepared from the aqueous extracts, is respectively as 3·00 and 0·33 per cent. of the weight of the seed and capsules.

This quantity, separated from the seed by exhaustion with boiling water, does not form the entire amount of digitaline; for, like resinous substances, it is not only soluble in alcohol, but also in oils, and it is partially combined with the fat oil of the seed.

The oil containing the digitaline, which can be extracted by ether, amounts to about 40 per cent. of the weight of the seed; it

belongs to the siccative oils. Ether extracts, besides the oil, another more resinous digitaline compound, which sinks in water, while the oil floats on the top. A portion of the digitaline compound can be removed from the oil by water.

The tannate of digitaline is soluble in hot water; on cooling, it again separates for the greater part.

Digitaline prevents the fermentation of an aqueous solution of sugar; it must therefore be considered as a poison to beer-yeast.—*Chem. Gaz. from* Buchner's *Repert.*

ON A NEW TEST FOR UREA.

By Professor Liebig.

When a solution of pure urea is rendered strongly alkaline with solution of caustic potash, a solution of corrosive sublimate added to it by degrees, a dazzling white precipitate—a combination of the peroxide of mercury with urea—is obtained.

As is well known, a dilute aqueous solution of corrosive sublimate may be mixed with an excess of a solution of bicarbonate of potash without the immediate production of a precipitate; if a solution of urea be added to this mixture, the above-mentioned white precipitate of urea and peroxide of mercury is immediately formed. This compound is so little soluble in water, that by this process 1-5000th urea can be detected with certainty in a liquid. The whole of the urea can be precipitated from urine by this means, and its application to the quantitative determination of urea in animal fluids is evident. I shall take an early opportunity of describing a suitable method for this purpose.

When oxide of silver (recently precipitated is best) is placed in an aqueous solution of urea, it is converted, in the course of a few hours, more quickly when gently heated, into a gray or yellowish-gray granular powder, which appears under the microscope to consist of transparent crystals. This compound when dry gives off ammonia when heated, leaving cyanate of silver, which burns at a higher temperature into sesquicyanide of silver, and finally into pure silver.—*Chem. Gaz. from Liebig's Annalen, Oct.*, 1851.

ON SOME COMBINATIONS OF THE ALKALOIDS WITH TARTARIC ACID.

By M. Arppe.

Tartrate of Morphine, $C^{35} H^{20} NO^{6}, HO, C^{4} H^{2} O^{5}$.—When morphine is added to a solution of bitartrate of potash until the solution is neutral, some bitartrate of potash first separates, and then tartrate of morphine, while neutral tartrate of potash remains in the solution. When morphine is digested with a solution of tartaric acid until the liquid has a neutral re-action, verrucoid groups of crystals, similar to the preceding, and consisting of concentrically-arranged groups of needles, separate on slow evaporation. They effloresce externally at about 68° F., but do not part with the entire amount of their water of crystallization below 266°.

The salt is readily soluble in water, and likewise in alcohol. Neither caustic nor carbonated alkalies cause a precipitate in the aqueous solution; and the same is the case with chloride of calcium, unless the solution is mixed with caustic potash; ammonia does not behave in this respect like potash. The most remarkable property of this salt is, that, on being heated to 266°–284°, it exhibits electrical polarity, which it retains for more than an hour after it has become perfectly cold. A small granule of the effloresced salt is gradually projected several inches. The same phænomenon is exhibited every time it is heated. The salt prepared with bitartrate of potash contained 6.824 per cent. of water, the other 6·496, 6.553, 6·41; the above formula requires 6·853 per cent. Laurents formula, $C^{34} H^{19} NO^{6}$, gives a much greater difference in the amount of water.

Bitartrate of Morphine, $C^{5} H^{20} NO^{6}, HO+2C^{4} H^{2} O^{5}, HO$ (dried,) crystallizes readily from acid solutions, being far more soluble than the neutral salt. It is obtained by mixing the base and acid in equivalent proportions, &c. in smooth rectangular prisms. The salt loses 2 per cent. of water before it begins to be decomposed, which takes place below 284°. On cautiously applying heat, a small portion may be melted without decomposition. When dried in the air, the salt contains one more equivalent of water than is given in the above formula; it loses up to 212o, 1·99 per

cent.; from thence to 248°–284°, so much more that the entire loss amounts to 2·43 per cent.

Tartrate of Strychnine, $C^{44} H^{24} N^2 O^4, HO, C^4 H^2 O^5 + 4HO$.—Strychnine behaves like quinine towards tartrate of potash; when the solution of the latter has been saturated with the alkaloid, shining needles more than an inch in length separate, which dissolve in water and in weak alcohol. The same salt is obtained from a neutral solution of strychnine in tartaric acid; it effloresces in the air without falling to a powder, becomes anhydrous at 266° and may be heated to 302° without further loss.

The salt prepared from bitartrate of potash gave in one experiment 7-76 per cent. of water, and left on ignition an exceedingly small residue of carbonate of potash. The strychnine is precipitated from a solution of the salt by potash and ammonia. Chloride of potassium gives no precipitate. The salt prepared with tartaric acid contains 7·588 per cent. of water of crystallization; the above formula requires 7·588.

Bitartrate of Strychnine, $C^{44} H^{24} N^2 O^4, HO, C^4 H^2 O^5 + HO, C^4 H^2 O^5 + 6HO$, is the salt which separates when an excess of tartaric acid is employed. The slender acicular crystals, which have a strong lustre even when dry, do not effloresce in the air, and are not very soluble in water; potash produces no precipitate at first, but after a time causes a considerable opacity. A portion of the water of crystallization is expelled at 212°, but it does not part with the whole below 257°; it may then be heated without further loss to 302°. The air-dried salt gave at 257°, 284°, 302°, the same amount of water, viz. 10·11 per cent.

Tartrate of Quinine, $C^{20} H^{12} NO^2, HO, C\ H^2 O^5$.—Quinine dissolves with difficulty in a solution of bitartrate of potash; on evaporating the solution, a mixture of bitartrate of potash and a crystalline salt of quinine separates. When an acid solution of quinine is neutralized with potash, slender acicular crystals of tartrate of quinine are obtained on evaporation, contaminated with the acid potash salt; the mother-liquor finally deposits neutral tartrate of potash. The salt, which quinine forms in preference with tartaric acid, is easily obtained by decomposing sulphate of quinine with neutral tartrate of potash, when a distinctly crystalline powder separates; this has a bitter taste, a neutral reaction, is sparingly soluble in water, and melts, when carefully heated,

without decomposition. At 266°–293°, it lost 1.5 per cent. of water, and did not effloresce. It appears to be anhydrous.

When tartaric acid is neutralized with quinine, only a gum-like mass is obtained on evaporation. If the acid is in excess, an acid salt crystallizes from the thick mother-liquor, which, owing to its ready solubility, could not be separated for closer examination. The solution has an acid and bitter taste, and exhibits a blue and red opalescence. When heated, the salt melts, turns yellow, and becomes resinous. The above formula requires 81.2 per cent. of quinine. Laurent's formula, $C^{38}\,H^{22}\,N^{2}\,O^{4}$, being admitted as correct, and the salt supposed to be neutral$=C^{38}\,H^{22}\,N^{2}\,O^{4}, HO, C^{4}\,H^{2}\,O^{5}$, requires 80·52 per cent. Potash separated from a solution of the salt 79 per cent of quinine; and as it was found that the potash dissolves some quinine, the author concludes that the first formula is most correct.

Tartrate of Cinchonine, $C^{20}\,H^{12}\,NO^{2}, HO, C^{4}\,H^{2}\,O^{5}+C^{20}\,H^{12}\,NO^{2}+2HO$.—Free tartaric acid behaves in the same manner to cinchonine as to quinine. On neutralizing bitartrate of potash with cinchonine, which dissolves readily and in abundance, there is formed, on cooling or evaporation, a considerable number of tolerably large acicular crystals, grouped in fascicles. They are very sparingly soluble in water, not altered in the air, and do not part with their water of crystallization below 212°–248°. In the anhydrous state, they exhibit electrical polarity, like the salt of morphine, only weaker. The whole of the cinchonine can be precipitated from its solution by potash. The air-dried salt lost up to 248°–257°, 4·69 and 4·62 per cent of water, and nothing more then up to 356°, at which temperature it begins to decompose. The above formula requires 4·49 per cent. of water. Laurent's formula, $C^{38}\,H^{22}\,N^{2}\,O^{2}$, requires 4·65, admitting the salt to be $C^{38}\,H^{22}\,N^{2}\,O^{2}, HO, C^{4}\,H^{2}\,O^{5}+2HO$.

Tartrate of potash forms no double salts with the alkaloids.—*Journ. für Prakt. Chem.*, li. p. 331.

ON THE DETECTION OF RESIN OF JALAP, RESIN OF GUAIACUM AND COLOPHONY, IN THE RESIN OF SCAMMONY.

By M. Thorel.

In expressing the opinion, some time ago, that the resin of scammony was the part of the drug that ought to be administered as a therapeutic agent, I conceived that this resin ought always to be prepared by the pharmaceutist himself.

Whenever the pharmaceutist, from any cause, is prevented from preparing it, and is obliged to purchase that which is met with in commerce, it is necessary that care should be taken to ascertain that it is pure.

Any adulteration would soon be discovered, unless the substance added was in small quantity or its action similar to that of the resin itself. Resin of jalap being of the latter class, and being at the same time cheaper than resin of scammony, has been used for adulterating it. The fraud is a very unjustifiable one, notwithstanding the fact that the substance used is somewhat similar in action, for no substitution of one agent for another should be tolerated in medicines.

I propose, for the detection of this fraud, a method which is founded on the perfect insolubility of resin of jalap in rectified ether, and the solubility in all proportions of the resin of scammony in this menstruum.

There are other substances, besides resin of jalap, which are used for adulterating resin of scammony, such as resin of guaiacum and colophony, and these are still more objectionable, as they are inert.

Resin of guaiacum may be easily detected by means of nitrous acid gas, or bichloride of mercury.

There are several reagents which may be used for detecting the presence of colophony in resin of scammony. Among them is oil of turpentine, which dissolves colophony at common temperature, and leaves resin of scammony almost wholly unacted upon.

But the best reagent for this purpose is sulphuric acid, which possesses the property of dissolving many resins, and of modifying,

more or less, their composition. If a little of this acid be poured over colophony, it immediately, and by simple contact, developes an intense red color. The same acid, when poured over pure resin of scammony, produces, on the contrary, no immediate change; it is only, after the lapse of some minutes, and with contact of the air, that it becomes colored, and then but slightly, the color being that of wine dregs.

By this means, the presence of one-twentieth part of colophony may be detected in resin of scammony. For this purpose, it is only necessary to put four or five grains of the resin into a glass or porcelain mortar, to add 60 or 80 grains of the oil of vitriol of commerce, and to rub it with the pestle. If the resin of scammony should contain colophony, the mixture will at once become red, but if on the contrary it is pure, it would only become colored after some time.—*London Pharm. Journ., from Repertoire de Pharmacie.*

REMARKS ON THE FLUID EXTRACT OF ERGOT.

By Joseph Laidley, Pharmaceutist, of Richmond, Virginia.

The preparations [of ergot] heretofore employed have been the (solid) extract, decoction, injection, tincture, syrup, compound powder, pill, wine and the oil. Pills and the extract are only suitable for administration in such cases as require the continued use of the medicine ; being solid, they do not exert their influence speedily enough for cases of labor ; besides, not one of the above preparations fully represents ergot. We are as yet unacquainted with the active principle of this medicine. It was supposed to be the oil; but this view has been shaken by the fact that the oil, when obtained by *simple expression*, is inert; but when procured by treating ergot in powder with ether, and allowing the latter to evaporate spontaneously, the resulting oil possesses in some degree at least the properties of ergot, shewing that the oil, when obtained by means of ether, probably contains *some* of the active principle dissolved in it, but is not itself that principle. Again, it was thought by others that in the extract (sometimes, but erroneously

termed ergotine) resided the active principle; but this view has given place to the belief that while it possesses some activity, yet it is not *the* active principle. While this subject is invested with so much doubt, there seems to be but one proper course to pursue in making a preparation of the drug—that is, to make a medicine that will exactly represent ergot in its natural form. This the author has done. He was desirous of offering to the obstetrical practitioner a medicine that will relieve the latter of the difficulty he has labored under when prescribing ergot, caused by the uncertainty of the drug itself, (owing to age or other cause,) or of weak preparations made from, probably, an equally uncertain article. In fulfilment of this desire the fluid extract is offered. It is prepared by treating fresh and good ergot in powder, first with ether, allowing the latter to *evaporate spontaneously*, thus securing all the oil; then with alcohol, and lastly with water; the last two liquids are evaporated below 212° until the fluid measures one-third as many fluid ounces as the ergot employed weighed in troy ounces; sufficient sugar is added to preserve it, and the oil is then thoroughly incorporated, and sufficient water added to render it of such strength that one fluid drachm (one teaspoonful) will represent 40 grains or about two doses of ergot.

Prepared as above, fluid extract of ergot is in the form of a concentrated syrup, possessing the advantages of being pleasant to take, of being always ready for use, thus avoiding the delay sometimes attendant upon administering a medicine where delay is so hazardous as in labor. The smallness of the dose is another recommendation in its favor. The writer believes that it will keep unchanged for a long time. Some in his possession, after having been kept for about two months in a moderately warm situation, is entirely unchanged. Some of this preparation was furnished to Dr. C. S. Mills of this city, who tested it in a case of labor about the middle of November. He informs the writer that it proved entire satisfactory; its action was almost immediate and produced no nausea.—*Stethoscope, Jan.* 1852.

LETTER ON OPIUM, SCAMMONY AND OIL OF ROSES.

The following letter, addressed to a Commercial House in this city, [New York] will be found to communicate some interesting information. We print it as it is written. Perhaps our readers may derive some information from the prices given ; we can make nothing of them.

Constantinople, May 10, 1851.

To —— Trieste,

We received your honored letter, dated Messina, with great pleasure, and hasten to give you the information you desire hoping and wishing that both an agreeable and useful connection may arise from it, for which purpose we shall not fail to give your House direct information, respecting the articles you mention. Opium is found here in different qualities, the goodness of which chiefly depends on the conscientiousness of those who prepare it. The best quality coming from some districts of Asia consists of the pure juice, which flows spontaneously from the incisions made in the poppy heads, is inspissated and formed into little balls. It has eminently all the qualities which are requisite in good opium, and contains from 8 to 10 per cent. and more, of morphia. This sort is the most in request among the druggists in Germany and France, to be sold by retail to the apothecaries, but scarcely forms the 8th or 10th part of all the Turkish opium which comes to the market. Next to this is the ordinary quality, coming from the other provinces of Asia Minor; where in preparing it, they are less cautious, partly pressing the poppy heads, in order to get as much juice as possible, partly scraping the juice that has oozed out too hard, by which certain mucilaginous parts of the plant, and shavings of the rind, get mixed up with it; in this way that kind of opium is produced, which is so often sold, and at Trieste bears the name of Tarense opium.

By this proceeding, of course, the morphia is lessened, and often in a great degree; but in the Chinese market, in proportion to which the consumption of the article in all other countries is scarcely to be reckoned, little or no regard is paid to this, which explains why the latter inferior article always brings nearly as high a price as the former pure quality. Besides these, several sorts of adulterated opium are sold, some of which are prepared, (principally for the North American market,) by mixing in the juice of the whole plant, or other substances. The

difference of the qualities would be best perceived by a collection of samples, which we should be glad to send you, if you would tell us where to direct them. The price of the aforementioned prime quality, which we call "Güeve," from the district which chiefly produces it is, now $10\frac{2}{3}$c. for the English pound, free on board. The current second quality, $10\frac{1}{3}$c. The price of the adulterated is much lower, in proportion to amount of the adulteration; which, however, in most cases, is not discernible by the exterior. The prices are, of course, principally regulated by the Chinese market; yet the more or less considerable crop produced is not without influence. So especially now, the growers show little inclination to sell, as the new plantations are endangered by a continual want of rain. Nevertheless, probably after two months, when the new crop begins to come to market, we may be able to buy cheaper than now, if the news from China should not cause the price to rise.

As regards scammony, almost everything that has been said respecting opium is literally applicable. The difference in quality depends upon the way of preparing it, while the plant from which it is taken is always the same. The best sort is the pure dried juice, which spontaneously flows from the incisions made in the root of the plant; the next quality is produced by a strong pressure of the root. These two qualities go in commerce by the name of the 1st and 2d scammony d'Aleppo, which name, however, is wrong, as Aleppo produces the 1st quality, but only in a very small quantity, whilst the greater part comes from several districts of Asia Minor. Then follows the so called quality of Skilip, a district that produces much, but where they have the bad habit of trying to gain in the weight, by adulterating the pure substance. The adulteration is made in several ways; the least injurious of which perhaps is, that they add (as in opium), the pressed or boiled out juice of the whole plant; the not inconsiderable quantities of this sort, which are yearly brought from the interior, find a good sale in Europe, which would hardly last, if a sufficient quantity of the before mentioned finer qualities were to be had. Besides these, a number of other sorts are sold in Europe, under the name Smyrna scammony, which consist of a hard and heavy mass, but contain only a very small part of the real scammony.

With this article it would also be necessary, as we said with

the opium, to explain our statement by sending you samples, which we will do if you desire it. The finest prime sort is seldom found, and is now entirely wanting. It would sell readily at the rate of $21\frac{1}{2}$c. per pound, English. The good second quality brings according to the sort, from 18c. to $15\frac{3}{4}$c. a pound, free on board, but is also now very scarce, and will, in the course of two or three months, be more abundant in fresh quality. Of the Skilip sort, there are several quantities in the market, according to the quality, at the price of 13 to 10s. 10d. an English pound, free on board.

Of the oil of roses, there is, properly speaking, only one genuine quality, with only little difference in odor, but with remarkable variation in the facility with which it congeals, which property is almost generally considered an essential proof of its being genuine, but without reason; as we have ascertained by much experience, during a long sojourn in the country where it is produced. Several reasons may contribute to this difference of congealing, but the chief one may be considered the difference of soil, and method of preparation. We give our principal attention to the article, and have founded an establishment at Kissanlik, where it is chiefly produced, through which alone we make our purchases, and must do so, in order to have the attar genuine, as we have experienced, that all the essence without exception that is sold here, second hand, is far from pure.

The common method and the one now almost exclusively adopted of adulterating it, with geranium essence, may be known to you, and that it really is the most in use, you may conclude from the price of the genuine article having been for a long time much higher at the places of production, than the price of that which is sold as prime in Europe. This fact has only lately been noticed in Europe, therefore in the price current of Trieste, for instance, you will find the genuine article noted, besides the prime article, with a considerable difference of price. What at London is designated as prime quality, is only a mixture of 60 to 70 per cent. essence of rose, with 30 to 40 per cent. essence of geranium. Samples will also prove this to you more clearly. The price of the genuine attar is, to-day, $22\frac{3}{4}$c. for an ounce, at 10 drachms, according to which the English price current may be understood; in six or eight weeks after the preparation of the new crop, we hope to buy cheaper, but at what rate we cannot yet judge, as this

depends on the produce of the crop. There is some cheaper and adulterated, and which is only bought by ignorant persons. This oil comes by caravans from the interior of Asia, and in spite of all our inquiries, we could not succeed in getting any sure information about the plant which produces it, or the method of preparation.—*New York Journal of Pharmacy, Feb.* 1852.

ON THE PRODUCTION OF SALTPETRE AND SODA IN HUNGARY.

By Jos. Szabó of Pesth.

Professor Szabó describes the methods employed in Hungary to procure saltpetre, from which it receives the following technical names:—

Gay Saltpetre.—This is the kind obtained by washing the earth dug from the floors of the rooms occupied by the poorer classes, to whom boarded floors are unknown. The nitre-boilers prefer the gay earth to all other materials. Although it affords only a poor lye of 2°–3°, it yields a purer saltpetre, with no other impurity than chloride of sodium. Therefore even the government regulations against the manufacture of nitre from this source have met with no success.

Plantation Saltpetre is now obtained almost exclusively from those plantations belonging to Baron v. Vay, near Debreczin, established at the time of the war with France, and which are still regularly worked. They consist of nearly 1000 pyramids, 12 feet in length, 3–4 feet broad, and 6–8 feet high, composed of two-thirds of washed gay earth and one-third ashes. As they are entirely uncovered, they do not yield more than about 300 cwt. of saltpetre annually, while rather more than 50 gay-earth heaps at Bicske are said to yield more than 200 cwt. annually. These pyramids are scraped down three or four times a year, and the part removed washed with water to extract the salt.

Kehr Saltpetre is produced at the kehr places (*Salétromszérü,*) which occur most frequently near Debreczin, in the district between the Theiss and Marosch. There are also saltpetre kehr places at the military boundaries near Alibunár. The boiling-

house at Debreczin is said to have been established more than two hundred years. In Debreczin itself there is an artificial and not very productive kehr place near the boiling-house, as well as also a few plantations, and besides these the natural kehr places of twenty-four villages belong to the town. These far more productive natural kehr places are always situated in the immediate neighborhood of the villages; the most important are at Mike-Pércs, Paláyi, Vértes, Ascád, Sz. Mihály, Nánás, and Szoboszló. The workmen are all inhabitants of the villages, and carry on the manufacture of saltpetre in conjunction with agriculture. Szabó visited one of the principal kehr places, that at Mike-Pércs, during the most favorable season, and ascertained all the particulars connected with it, which he states to be essentially the same at all the others.

The kehr places at Mike-Pércs is situated upon a gently sloping ground between a village and a marsh, which is never quite dry. It does not, like the natural soda kehr places in Hungary, yield the salt directly; but it is necessary that the earth, consisting of loose black sand mixed with chalk and clay, which formerly was a part of the marsh, should be strewed from time to time with ashes, especially straw-ashes, in order to make the salt come out upon the surface. The constantly moist ground receives the organic matters, partly from the marsh and partly from the village, all the drainage from which flows to the marsh. As manure is not used there to put upon the land, but only for making banks round the fields, the saltpetre grounds receive a sufficient supply of appropriate material. Under these favorable circumstances, the saltpetre is formed, chiefly in May and June, even during twenty-four hours, in such quantity that it can be collected every evening. The uppermost surface of earth is scraped off by means of an iron, shaped like a knife, which is dragged by a horse, and the saline earth swept together and collected, while all the irregularities of the ground are again carefully levelled.

The establishment of a new kehr place is preceded by a formal examination, in which attention is paid to the occurrence of certain narcotic plants. Upon such ground as is suitable for kehr places, very good tobacco grows, which, however, is not used in consequence of its deflagrating in the pipe. All plants which assimilate saltpetre are carefully removed from the kehr places.

With regard to the geognostic relations of the kehr places, Szabó remarks that the efflorescent product of the kehr places contains not only potash saltpetre, but other salts as well, such as sulphate of magnesia, and especially carbonate of soda, sometimes in such quantity, that it is preferred to make use of the kehr saltpetre in the soap factory of Debreczin.

The formation of kehr saltpetre stands in evident connection with that of kehr soda. Besides the saltpetre and soda district of Debreczin, the soda region forms a broad band running through the centre of the great Hungarian plain, especially of the sandy ground in the Pesth and Bács districts. There are in this direction a great number of lakes and marshes, the waters of which are not in all cases saline. In the saline lakes, the greater part of the soda effloresces, not immediately at the water's edge, but upon that part of their banks which is left dry by the evaporation in warm weather. This spot becomes covered with an abundant coating of soda, which is collected by sweeping it together. However, soda kehr places sometimes occur in situations which are considerably more elevated than those lakes. Szabó refers the formation of soda to the action of carbonate of lime in solution upon silicates of soda. He is of opinion that carbonate of potash is formed in a similar manner, but that on account of its ready solubility it remains unobserved.

The detailed description of the processes of washing the kehr earth, and the refraction of the lye, that is the addition to it of an alkaline lye, the extraction of raw saltpetre by evaporation, and the refining of the saltpetre, which operations are for the most part carried on by the country people themselves, testifies to the already advanced state of the manufacture of saltpetre in Hungary, which it is probable however may still admit of considerable extension.—*Chem. Gaz., from Archiv der Pharm.*, vol. lxvi. pp. 311–316.

ON THE EXAMINATION OF SULPHATE OF QUINIA, WITH A VIEW TO THE PRESENCE OF THE SULPHATE OF CINCHONIA.

By M. Soubeiran.

M. Liebig has suggested the following method to separate cinchonia from quinia in the sulphate: Triturate 15 grains of the sulphate of quinia with two ounces of solution of ammonia, throw

the whole in a flask, add two ounces of ether, agitate many times and suffer it to rest. The quinia liberated by the ammonia is dissolved by the ether, whilst the cinchonia insoluble both in the ammoniacal liquid and the ether floats between the two liquids.

This process appears to be the simplest of all that have been proposed; but as M. Henry has shown (Jour. de Pharm., 1849,) that cinchonia is not entirely insoluble in ammonia, we prefer the following modification of M. Liebig's method:

38 grains of sulphate of quinia are taken from an ounce bottle of the salt, its contents having been well mixed, and introduced into a flask with half an ounce of solution of ammonia, agitate them well, and allow the mixture to repose 24 hours. It is then heated in a water bath until the excess of ammonia has been driven off almost completely, allow it to cool and add one ounce of pure ether. By agitation the quinine is dissolved quickly and completely, and by rest the contents of the flask consists of two transparent liquids, the lower containing sulphate of ammonia, the upper quinia dissolved in ether without any intermediate stratum of cinchonia, if the salt is pure.

To test the accuracy of the process, 30 grains of sulphate of quinia was mixed intimately with $1\frac{1}{2}$ grains of sulphate of cinchonia and proceeded with as above. The ether dissolved the quinia readily as before, but the cinchonia remained as an insoluble layer, between, which was so voluminous that a fifth part of the quantity used might have been detected.—*Jour. de Pharm.* Jan. 1852.

[Note. This ready method of detecting cinchonia is of value, as it has, (we are informed) become quite usual with the manufacturers to crystallize all the sulphate of cinchonia they can with the quinine. Heretofore testimony has been unfavorable to the claims of cinchonia to much therapeutic value, and until it shall be otherwise determined cinchonia should be looked upon as an adulteration. We are informed that careful experiments are now in progress in this city at one of our public institutions, by a physician eminently qualified to conduct them, to determine the real merits of this alkaloid in a medical point of view.—Ed. Amer. Jour. Pharm.]

OBSERVATIONS ON THE PREPARATION OF PHOSPHORUS.

By M. Donovan.

The process ordinarily followed for the preparation of phosphorus comprehends various operations, which render the execution long and difficult. For instance, the calcination of the bone to destroy

its organic matter; the pulverization and sifting of it to facilitate the action of sulphuric acid upon it; the washing of the sulphate of lime to remove the acid phosphate which it retains obstinately; the evaporation of the washing waters to get the product dry to mix with the carbon for final distillation in an appropriate apparatus, are certainly long and tedious operations, the practical details of which are truly inconvenient.

The new process suggested by M. Donovan, singularly facilitates the preparation of phosphorus. It consists as follows:

Take beef or sheep bones as they are found in commerce, with their natural quantity of fatty matter and moisture. They are digested during four hours in a mixture of one part of nitric acid of commerce, and ten parts of water. The calcareous salts are removed and dissolved, whilst the soft flexible gelatinous tissues, retaining the form of the bones, remain. These can be washed and employed in the manufacture of glue.

The slightly acid liquid containing the phosphate and nitrate of lime, is then treated with an excess of neutral acetate of lead, and the precipitate of phosphate of lead washed and dried. It is then put in a covered crucible and heated to redness to condense its volume, but this operation requires care, else the phosphate will lose its pulverulent form and fuse, requiring a difficult pulverization.

The dense pulverulent phosphate is then intimately mixed with one sixth of its weight of charcoal, previously calcined, and afterwards distilled in the ordinary manner in large earthen retorts, properly heated.

If it is desired to prepare but a small quantity of phosphorus, it will be found more eligible to use harts-horn shavings, which, though costly, contain a large percentage of phosphate of lime. The process then becomes neat and elegant, its execution prompt and easy, and time, trouble and combustible matter are economised, besides much smaller vessels being required.

The following proportions of harts-horn shavings are requisite:

Harts-horn shavings, (not calcined)	500 parts.
Nitric acid of commerce,	530 "
Water,	5000 "
Neutral acetate of lead,	750 "

In addition to the advantages of employing harts-horn shavings mentioned, the gelatinous matter remaining is sufficiently pure for use in making jellies.—*Jour. de Pharmacie, Jan.*, 1852.

Varieties.

Disulphate of Quinia rendered soluble by Tartaric Acid.—M. Righini has proposed to substitute tartaric acid for sulphuric acid to render the commercial sulphate of quiniæ soluble in water when directed in solution by prescriptions, as being less austere and disagreeable to the taste. M. Casorati, of Turin, gives the following formula: Sulphate of Quinia, *six grains;* Tartaric Acid, *three grains*; Syrup of Oranges, *a fluid ounce. L'Abeille Médicale.*

Bark of the Musssenna Tree (of Abyssinia) a Remedy for Tape Worm.—By Dr. Prunerbey.—This bark, derived from a leguminous tree, is a popular remedy in Abyssinia for the tænia which is so common in that country, and for which the kousso is so celebrated. Dr. Prunerbey treated a patient with this bark with the following results. It was given by admixing about two ounces of the powdered bark with hashed meat slightly cooked. The patient eat nothing the evening preceding, nor on the day the medicine was administered until the evening, when he took a little rice. The next day the worm was passed with a soft stool, in many pieces, a little softened and decomposed. Since this case, the author used the remedy with complete success in nineteen cases. Its action differs from that of kousso by killing the parasite without causing diarrhœa.—*Jour. de Chimie Méd.*, Feb. 1852.

Purgative Syrup of Jalap. By M. Viel.—Take of powdered jalap, an ounce; alcohol, 3½ fluid ounces; water, 26½ fluid ounces; sugar, 30 ounces. Digest the jalap in the water and alcohol, previously mixed in a flask, during five or six hours, at the temperature of 90° to 100° F., filter, add the sugar and dissolve it, aromatise and preserve for use.

This syrup, which is an agreeable purge for young children, may be given in tea-spoonful doses.—*Ibid.*

Soluble Iodide of Starch. By M. Duboys, of Limoges.—Take of pulverized iodine one part, starch 9 parts. The starch is gradually added in small quantities to the iodine, with constant trituration. The mixture is then moistened with a little water introduced into a flask and heated, plunged up to its neck in a water bath. The flask is withdrawn and agitated from time to time and the iodide tested as to its solubility. The heating is continued during three hours to effect its complete and instantaneous solubility in water.

The iodide is found in the retort in the form of a thick, tenacious and elastic paste which is washed thoroughly on a filter with rectified alcohol, and then dried in a stove, or in free air.

The iodide, after desiccation, is black, brilliant, nearly inodorous, nearly

crystalline and friable; reduced to powder it preserves its brilliancy. This powder adheres to the fingers and colors them if moist. The solution in water has a Prussian blue color.—*Jour. de Chimie Méd.*, Dec. 1851.

Syrup of Iodide of Starch.—Put two drachms and a half of soluble iodide of starch in a pint flask, and pour on it four ounces and a half of boiling water and boil for two minutes, then add eight ounces of finely powdered sugar and dissolve. Thus prepared the syrup contains no globules when examined with a lens, is very limpid, and is exempt from the styptic taste of the ordinary preparations of iodine. This syrup should not be kept long, and should be preserved in well stopped bottles.—*Jour. de Chimie Méd.*, Feb. 1852.

Gentianin recommended as a substitute for Cinchona.—Dr. Kuchenmeister affirms that impure and uncrystallized gentianin can be substituted for sulphate of quinia, and he has noticed: 1st, that this substance acts on the spleen at least as efficaciously as sulphate of quinia. 2d. Its action is not less rapid. 3d. That it is sufficient to administer 15 to 30 grains twice a day; and 4th, that gentianin constitutes probably the most valuable substitute for Peruvian bark.—*Jour. Chimie Méd.* Dec. 1851.

Preparation of Dahlia or Georgina Paper.—Dahlia paper is prepared by bruising the petals of the red dahlia with a little water, expressing the juice and filtering. This is then applied to white filtering paper by means of a pencil brush. This paper, which may replace the litmus paper, is colored red by acids and green by alkalies. If the color of the juice is not sufficiently deep, it may be concentrated by evaporation, filtered, and then used.—*Ibid.*

Mannite in the Leaves of the Lilac. By M. Zachariah Roussin.—M. Roussin has obtained mannite from the leaves of the lilac (syringa vulgaris) in considerable quantity by precipitating a decoction with neutral acetate of lead, filtering, removing the excess of lead by hydrosulphuric acid, again filtering and evaporating to an extract. This extract treated with boiling alcohol of 60° and the solution filtered hot, deposits, on cooling, a voluminous crystallization of mannite.—*Ibid.*

On the Employment of Sulphate of Zinc for the Preservation of Animal Matter. By M. Falconet.—According to the author, the substances the most difficult to preserve, as the brain, the intestines, and other pathological preparations, may be most effectually preserved in a solution of the sulphate of zinc, retaining all their characters without the least alteration, and, what is very important, not experiencing the contraction observed when alcohol is used. The steel instruments employed for operating on

the substances which have been injected with the preserving liquid, are not injured even when immersed directly in the liquid, and left there for twenty-four hours.—*Comptes Rendus.*

Iodine rendered soluble by Syrup of Orange-peel and Tannin.—M. Debanque mentions, in the *Journal de Pharmacie* of Antwerp, that he has found means of keeping iodine in a state of solution, when added to mixtures in the form of tincture. The author uses for that purpose syrup of orange-peel, which answers the purpose perfectly. It was suspected that *tannin* was mainly instrumental in this result; and this was rendered evident by putting a few grains of tannin into a quantity of water to which tincture of iodine has been added, and in which the iodine had of course been precipitated. The addition of the tannin caused the iodine to be immediately re-dissolved. Thus will the syrup of orange-peel be advantageously added to mixtures containing tincture of iodine, and tannin to injections composed of water and the same tincture.—*Med. Exam. and Lancet.*

Cement for Mending China, &c.—Take of isinglass two drachms, sprinkle it with water and allow it to stand until softened, then add as much proof spirit as will rather more than cover it, and dissolve with a moderate heat. Take of gum mastic one drachm, dissolve it in two or three drachms of rectified spirit. Mix the two solutions, and stir in one drachm of gum ammoniacum, previously reduced to fine powder and rubbed down with a little water. Evaporate, if necessary, in a water-bath to a proper consistence. Keep the cement in a bottle. When required for use plunge the bottle in warm water, and apply the cement with a stick or a small hard brush to the china previously warmed. Compress the pieces firmly together until cold, taking care to make the contact perfect, and using a very thin layer of cement. When properly applied the cement is almost, if not quite, as strong as the china itself, unless exposed to the combined action of heat and moisture.

Another cement, useful for many purposes, may be made by dissolving isinglass in glacial acetic acid, and reducing it to the consistence of a thin jelly. It may be applied in the same manner as the above, but does not require to be warmed.—*Pharm. Journ.*

On the proportions of Iodine contained in Cod-Liver Oils. By MM. Chevallier and Gobley.—We have followed the process indicated by MM. Girardin and Preisser. It consists, as is known, in saponifying the oil by an excess of a solution of caustic soda, at 25 degrees, then heating it, without allowing it to boil, until a perfect combination takes place, and afterwards evaporating the whole to dryness. The soap obtained is to be carefully carbonized in a closed crucible; towards the end of the carbonization a sufficient quantity of carbonate of ammonia is to be added to con-

vert the excess of caustic of soda contained in the mixture into carbonate. The carbonaceous residue is then exhausted by boiling alcohol at 96.100, and the alcoholic liquors evaporated to dryness, leaving a slightly saline residue consisting of iodide of potassium.

As we wished to arrive at more certain results than MM. Girardin and Preisser, we estimated, by means of chloride of palladium, the quantity of iodine contained in the saline residues; and in this manner we have been able to determine the actual quantity of iodide of potassium contained in the cod-liver oils we wished to examine.

The following are the results we obtained:—

1	litre of cod-liver oil yielding	0.10	gramme of iodide of potassium.		
2	. . . . .	0.08	"	"	"
3	. . . . . .	0.04	"	"	"
4	. . . . .	0.03	"	"	"

—*Pharm. Journ., from Journal de Chimie Médicale.*

On Peach-Leaf Water. By Messrs. Fellenberg and König.—The authors distilled in 1847 and 1848, peach-leaves with water, and the difference in the proportions of prussic acid in these two sorts of water was very considerable. The leaves which yielded the smaller proportion of prussic acid, were those of the year 1848, when the tree had an abundance of fruit, whilst in the year 1847. it had only one fruit. Mr. König in Bern, found in 1000 parts of a peach-leaf water, prepared by himself, 1.407 of prussic acid. That prepared by Fellenberg in 1848, contained in 1000 parts, 0·437 parts.—*London Pharm. Journ., from Central Blatt.*

[These facts are interesting in connection with the observations of Mr. Perot, at page 109.—*Ed. Am. Jour. Ph.*]

On some new Constituents in the Ergot of Rye. By Dr. F. L. Winckler.—In the analysis of ergotine, prepared by exhausting the ergot of rye with distilled water, and treating the aqueous extract with alcohol, &c., I have discovered in combination with an acid a volatile alkaloid, which is very similar to, if not identical with coniine. It is to this alkaloid that the ergot of rye appears to owe principally its effectiveness, and not, as has hitherto been admitted, to ergotine. Besides this alkaloid, I have found as constituents of ergotine an exceedingly small quantity of kinovic acid, formiate and chloride of potassium.—[See page 105.]—*London Chem. Gaz., from Central Blatt.*

On the administration of Cod-Liver Oil.—We extract from the *Gazette Medicale de Lyons* the following modes of exhibiting this nauseous remedy:

1. Cod-liver oil, 30 grammes; solution of carbonate of potash, 8 grammes; syrup of orange-peel, 30 grammes. Mix. A teaspoonful or two twice a day.

2. Cod-liver oil, syrup of orange-peel, aniseed water, equal parts. Mix. a tablespoonful for a dose.

3. Cod-liver oil, 250 grammes; gum arabic, 30 grammes. Make an emulsion, and add syrup of orange-peel, syrup of peppermint, each 30 grammes. A large tablespoonful for a dose.

The disagreeable flavor of the oil may be disguised by hot milk or coffee. *Prov. Med. and Surg. Journ., from Revue Med. Chirurg.*

Bromohydric Ether—a new Anæsthetic Agent.—Some experiments have been recently made with this substance on birds, etc., and M. Ed. Robin, who conducted them, is satisfied that it will prove an excellent anæsthetic agent. This preparation of ether is without taste, and possesses an agreeable aromatic odor; and, when taken by inhalation, produces rapid etherization, without any subsequent suffering or distressing symptoms.—*Journ. des Connaiss. Med. Chirurg and Charleston Med. Jour.*

Cannabis Indica as a substitute for Ergot. By Professor Christison.—Dr. Christison, of Edinburgh, considers Indian hemp (Cannabis Indica) to possess a remarkable power of increasing the force of uterine contraction during labor. He reports, in the August number of the *Edinburgh Journal of Medical Science*, some cases in which it was given, with this view, at the Maternity Hospital of Edinburgh. As compared with the action of ergot, that of Indian hemp presents the following points of difference: 'First—While the effect of ergot does not come on for some considerable time, that of hemp, if it is to appear, is observed within two or three minutes. Secondly—The action of ergot is of a lasting character, that of hemp is confined to a few pains shortly after its administration. Thirdly—The action of hemp is more energetic, and perhaps more certainly induced, than that of ergot.'—*Charleston Med. Jour. Jan.* 1852.

Solution of Phosphate of Iron and Quinine. By Dr. Cattell.—I have much pleasure in directing the attention of the profession to the therapeutical employment of a compound, formed of phosphoric acid, pure quinia, and hydrate peroxide of iron—solution of phosphate of quinine and iron. It was devised by me during the past year, and from an extensive trial of it, since that time, I am enabled to recommend it as a remedy likely to prove highly serviceable in those cases indicating the use of such a combination. As much uncertainty exists respecting the chemical relations of phosphoric acid, and the different bases, it is to the therapeutical and not to the chemical value of this compound that I attach importance. I shall avail myself of the earliest opportunity of making further observations on the subject.—*London Lancet and Charleston Journ.*

Solution of Aloes and Soda. By Professor Mettauer.—In this preparation the aloes is held in solution and its action modified by the presence of bicarbonate of soda. It is a useful aperient for persons of costive habit,

and may be employed without the unpleasant effects that sometimes result from the employment of aloes alone.

Take Socotrine Aloes,	two ounces and a half, *troy*;
Bicarbonate of Soda,	six ounces;
Compound Spirit of Lavender,	two fluid ounces;
Water,	four pints.

Macerate the mixture for two weeks with occasional agitation, and filter.

The dose is from a fluid drachm to a fluid ounce half an hour after meals.

Sumbul Root.—This root has usually been brought to England, *viâ* Russia, or from Russia. Some time since a box of the root arrived from India; and recently some tins of it have been received here from Bombay, per Overland Mail. The owner states that it cost him a great deal of money on account of the enormous distance from the interior which it had to be brought.

The *Indian Sumbul* differs somewhat from the Russian sort. The root has a closer texture, is firmer, denser, and has a more reddish tint. Some of the pieces have a slight resemblance to inferior rhubarb. The *Russian Sumbul* is more spongy, paler colored, with a yellowish green tint.

Both sorts have the same musky smell; but the Russian sort is perhaps more powerfully odorous.—*Pharm. Journ.*

Preparation of Tea. By Berthold Seemann.—In the *Manual of Scientific Inquiry* you ask whether, in the northern provinces of China, Indigo or any other vegetable dye is used in coloring green tea? Whether different processes of dying are pursued in the north from those of the south I cannot say, but it is certain that around Canton, whence great quantities are annually exported, the green tea is died with Prussian blue, turmeric, and gypsum, all reduced into fine powder. The process is well described by Sir John F. Davis (*The Chinese*, vol. iii. p. 244, *et seq.*,) who, however, falls into the strange mistake of supposing the whole proceeding of coloring to be an adulteration, and leaves his readers to infer that it is only occasionally done in order to meet the urgency of the demand, while it is now very well known that all the green tea of Canton has assumed that color by artificial dyeing. I had heard so much about tea—copper-plates, picking of the leaves, rolling them up with the fingers, boiling them in hot water, &c. &c.,—that I became anxious to see with my own eyes the process of manufacture, of which the various books had given me such a confused idea. One of the great merchants conducted me not only to his own but also to another establishment, where the preparation of the different sorts was going forward. There was no concealment or mysterious proceeding: everything was conducted openly, and exhibited with great civility; indeed, from all I saw in the country I am almost inclined to conclude that either the Chinese have greatly altered, or their wish to conceal and mystify everyhing, of which so much has been said, never existed.

The tea is brought to Canton unprepared. After its arrival it is first subjected to cleaning. Women and children are employed to pick out the pieces of twigs, seeds, and other impurities with which it happens to be intermixed. The only sorts which may be called natural are those gathered at different seasons: the rest are prepared by artificial means. Without entering into a description of all these processes, it may suffice to take one as an example. A quantity of *Bohea Saushung* was thrown into a spherical iron pan kept hot by means of a fire beneath. These leaves were constantly stirred about until they became thoroughly heated, when the dyes above mentioned were added, viz: to about twenty pounds of tea, one spoonful of gypsum, one of turmeric, and two or even three of Prussian blue. The leaves instantly changed into a bluish-green, and, having been stirred for a few minutes, were taken out. They, of course, had shrivelled and assumed different shapes from the heat. The different kinds were produced by sifting. The small longish leaves fell through the first sieve and formed Young Hyson, while those which had a roundish granular shape fell through last, and constituted Choo-cha, or gunpowder.—*Hooker's Jour. of Botany in Pharm. Journ.*

On the Jipijapa, or Panamá Hat Plant. By M. Berthold Seemann.—An indigenous production deserving special notice is the *Jipijapa* (*Carludovica palmata*, R. et Pav.,) a palm-like plant, of whose unexpanded leaves the far-famed "Panamá hats" are plaited. This species of *Carludovica* is distinguished from all others by being terrestrial, never climbing, and bearing fan-shaped leaves. The leaves are from six to fourteen feet high, and their lamina about four feet across. The spatha appears towards the end of the dry season, in February and March. In the Isthmus, the plant is called *Portorico*, and also *Jipijapa*, but the latter appellation is most common, and is diffused all along the coast as far as Peru and Chili; while in Ecuador a whole district derives its name from it. The *Jipijapa* is common in Panamá and Darien, especially in half-shady places; but its geographical range is by no means confined to them. It is found all along the western shores of New Granada and Ecuador; and I have noticed it even at Salango, where, however, it seems to reach its most southern limit, thus extending over twelve degrees of latitude, from the tenth N. to the second S. The Jipijapa, or Panamá hats, are principally manufactured in Veraguas and Western Panamá; not all, however, known in commerce by that name are plaited in the Isthmus; by far the greater portion is made in Manta, Monte Christi, and other parts of Ecuador. The hats are worn almost in the whole American continent and the West Indies, and would probably be equally used in Europe, did not their high price, varying from two to 150 dollars, prevent their importation. They are distinguished from all others by consisting only of a single piece, and by their lightness and flexibility. They may be rolled up and put into the pocket without injury. In the rainy season they are apt to get black, but by washing them with soap and

water, besmearing them with lime-juice or any other acid, and exposing them to the sun, their whiteness is easily restored. So little is known about these hats, that it may not be deemed out of place to insert here a notice of their manufacture. The "straw" (*paja,*) previous to plaiting, has to go through several processes. The leaves are gathered before they unfold, all their ribs and coarser veins removed, and the rest, without being separated from the base of the leaf, is reduced to shreds. After having been put in the sun for a day, and tied into a knot, the straw is immersed into boiling water until it becomes white. It is then hung up in a shady place, and subsequently bleached for two or three days. The straw is now ready for use, and in this state sent to different places, especially to Peru, where the Indians manufacture from it those beautiful cigar-cases, which fetch sometimes more than $30 apiece. The plaiting of the hats is very troublesome. It commences at the crown and finishes at the brim. They are made on a block, which is placed upon the knees, and requires to be constantly pressed with the breast. According to their quality, more or less time is occupied in their completion: the coarser ones may be finished in two or three days, the finest take as many months. The best times for plaiting are the morning hours and the rainy season, when the air is moist: in the middle of the day and in dry clear weather, the straw is apt to break, which, when the hat is finished, is betrayed by knots, and much diminishes the value.—*Ibid.*

An Improved Mode of Preparing Caffein. By H. J. Versmann, Apothecary, Lubeck.—All the authors have prepared caffein from good Brazilian coffee, and have operated on quantities of five, ten, and one hundred pounds. In the preparation of caffein, the direction is usually given to boil the raw coffee-berries, to combine it with oxide of lead, and then to separate it by sulphuric acid. This plan the author has tried, but has found it rather unprofitable, and has gained but little profitable results. By the boiling, the gum, and the mucus with which the oil is combined in coffee, were dissolved, and the separation of the pure caffein is rendered difficult. On the other hand, he recommends the following process, as simple and suitable to the purpose:—Ten parts of bruised coffee are mixed with two parts of caustic lime, previously converted into hydrate of lime. This mixture is placed in a displacement apparatus, with alcohol of 80°, until the fluid which passes through no longer furnishes evidence of the presence of caffein. The coffee is then roughly ground, and brought nearly to the state of a powder, and the refuse of the already once digested mixture from the displacement apparatus dried, and ground again, and, mixed with hydrate of lime, is once more macerated. The grinding is more easily effected after the coffee has been subjected to the operation of alcohol, having lost its horny quality, and the caffein is thus certainly extracted. The clear alcoholic fluid thus obtained is then to be distilled, and the refuse in the retort to be washed with warm water to separate the oil. The resulting fluid is then evaporated until it forms a crystalline mass, which is to be placed on a

thick filter, and the moisture expressed. The moisture, after evaporation, still furnishes some caffein. The impure caffein is freed from oil by pressure between folds of blotting paper, and purified by solution in water with animal charcoal, and is afterwards obtained in shining, white, silky crystals. In general, not more than three drachms were procured from five pounds of coffee, from ten pounds seven drachms, and from one hundred pounds, the largest quantity, viz: six ounces and four scruples of caffein; a proof that a large quantity must be operated upon if, in a quantitative respect, a satisfactory result is to be obtained. Thus it is seen, that good Brazilian coffee contains 0.57 per cent. of caffein. At the same time it may be observed that it contains about ten per cent. of a green liquid oil, and two per cent. of a yellow, firm fat (Palmtin.)—*Phar. Journ. and Archiv der Pharmacie*, November, 1851.

Filter Accelerator.—M. Dublanc describes an arrangement to accelerate the filtering process, which consists of a funnel-shaped tissue of plated or tinned wire on which the filter is supported in the funnel. It is shaped like a plaited filter, and is made from a flat circular piece of wire gauze, crimped in plaits running from centre to circumference so as to give it the shape of a funnel with fluted sides.—*Journ. de Pharm.*, February, 1852.

A New Test for Mercury.—If a strong solution of iodide of potassium be added to a minute portion of any of the salts of mercury, placed on a clean bright plate of copper, the mercury is immediately deposited in the metallic state, appearing as a silvery stain on the copper, which cannot be mistaken, as no other metal is deposited by the same means.

By this method corrosive sublimate may be detected in a drop of solution unaffected either by caustic potash or iodide of potassium. In a mixture of calomel and sugar in the proportion of one grain to two hundred, a distinct metallic stain will be obtained with one grain, which of course contains 1-200th of a grain of calomel; in like manner 1-400th of a grain of peroxide of mercury may be detected, although the mixture with sugar is not in the least colored by it.

With the preparations of mercury in the undiluted state, this process acts with remarkable accuracy, the smallest possible quantity of calomel or peroxide of mercury, such as would almost require a magnifying lens to perceive, placed on copper and treated with iodide of potassium, will give a distinct metallic stain.

The advantages of this test may be briefly stated as follows:—1st. It is a delicate test, inferior only to chloride of zinc and the galvanic test of zinc and gold. 2d. It is easy of application. 3d. It requires a very small portion of the substance to be examined—a matter of no small import. 4th. Acting on the insoluble as well as the soluble salts, it obviates the intermediate process of solution. 5th. When it acts its indications are decisive.

As to its disadvantages, the only one which seems tenable is, that

although it acts on minute portions, still that must be in a concentrated condition. For instance, though we may detect the 1-1000th of a grain of corrosive sublimate in a drop of water, we cannot detect it in a drachm; but this may of course be remedied by evaporation.

Now, with regard to the theory of this process, the following seems most satisfactory, that the iodide of potassium forms a soluble and easily decomposed salt with the various salts of mercury; that is, an iodide soluble in excess of the iodide of potassium.

The foregoing is the substance of a paper read by Mr. Arthur Morgan, City of Dublin Hospital, at the first meeting of the Student's Medico-Chirurgical Society, on Friday, December the 12th, 1851.—*Pharm. Journ., Feb.* 1852, *from Dublin Medical Press*, 1852.

[We have tried this test with several poisonous preparations of mercury, as white precipitate, turpeth mineral, etc., and find it extremely sensitive. A drop of distilled water on a bright penny, with a grain of iodide of potassium dissolved in it, gave a positive indication of mercury when one-eighth of a grain of sugar containing 1-3200ths of a grain of white precipitate was added to it.—*Ed. Am. Journ. Pharm.*]

Comparative Value of Cod-Liver Oil and Fish Oil mixed with Iodine.—Dr. Champouillon, professor at the Army Medical School of Val de Grace, has just laid before the Academy of Medicine the result of the comparative experiments he has made upon phthisical patients with cod-liver oil, and simple fish oil mixed with iodine. Dr. Champouillon gave the cod-liver oil to 120 patients laboring under phthisis. Fifty-one were in the first stage; and of these, twenty-four were benefitted, and none died. Thirty-seven were in the second stage; of these, nine recovered, and three died. Fourteen were in the third stage; and here six recoveries and four deaths took place. The author gave the iodated oil to seventy-five patients in different stages of phthisis: no improvement took place in any case, and in several it was noticed that the remedy did harm.—*Lancet.*

Cost of the Doctorate in Paris.—The Union Médicale makes the following estimate of the cost of the Degree of Doctor of Medicine in Paris:—The collegiate education requires 7 years, and to obtain the two baccalaureate degrees, 2 years more are necessary; then the medical studies, properly speaking, will average 6 years; making a total of 15 years. The 7 years at college cost 1000 francs per annum, making 7000 francs; the 2 baccalaureates, 320 francs; the 6 years at medical college, 1200 francs a year, or total 7200 francs. Private courses of study, 1000 francs; matriculations, examinations, and diploma fee, 1100 francs; instruments and books, 2000 francs. Making a grand total of 18,620 francs, or about $3,724.—*Med. Exam.*

Arabian and Cyprian Aloes.—Dr. X. Landerer states that much of the aloes employed in the East is produced in Arabia, where various species of

aloë grow in considerable abundance. The drug is rudely manufactured by the Arabs from the expressed juice, and is then carried to the bazaars of Alexandria, Cairo, Smyrna, &c.

The aloes produced in the island of Cyprus, though excellent in quality, is stated not to be prepared in sufficient quantity to admit of its being exported.—*London Pharm. Journ.*

Note on the Oil of Geranium having the Odor of Roses, (Pelargonium odoratissimum).—The geranium which has the odor of roses will yield on distillation *an aromatic water and an essential oil.* M. Recluz, a Chemist at Vaugirard, has stated, that previous to the year 1819, he had, by order of M. Tissier, Chemist and Professor of Chemistry at Lyons, submitted to distillation 1590 grammes of the leaves of this plant, operating by cohobation twice, he obtained eight grammes of a concrete volatile oil, analogous, in its odor, to that of the rose, congealable at 18° C.

Since the publication of M. Recluz, this question has made rapid progress, for there is now prepared in France a large quantity of the essential oil of geranium, which is used in perfumery.

The geranium, to obtain the essence, is cultivated in the south. It has also been cultivated in the department of Seine-et-Oise, at Montfort-Lamaury, and, according to M. Demarson, who has occupied himself and given much attention to this subject, its cultivation is easy; under our temperature the geranium thrives, especially when the nights are fresh.

The oil obtained in the department of Seine-et-Oise, is more agreeable in its odor than that obtained from the geranium cultivated in the south; the same is remarked with the geranium as with the orange flower.

The geranium is propagated by slips. These slips are planted usually in February, but they may be planted at any season.

100 lbs. of geranium leaves yielded from 54 to 55 grammes of essential oil; these leaves are sold at from 30 to 35 francs the 100 lbs., but care must be taken in the weighing, as they are not always well picked, and contain foreign matter, which increases the weight but does not yield oil. The distilled water which has been used in the production of the oil has some analogy to rose water, but it has a *vegetable odor*—an odor *sui generis*—which distinguishes it from it. This water, which was at first sold at 1 franc 25 cents the litre, has fallen to 60 centimes the litre.

The oil of geranium was, in the first instance, sold at a very high price; it has since fallen to 30 francs, to 25 and 20 francs, at last to 15 and to 12 francs.*

The oil of geranium of the Paris houses is of a green color; that of Nice is colorless. This oil is employed in the manufacture of essence of roses, which is very expensive. After having been used for adulterating, it is in its turn adulterated.—*London Pharm. Journ., from Journ. de Chimie Médicale.*

*It is not stated for what quantity this price is charged.—Ed. *Pharm. Journal.*

Magnesia as an Antidote for Poisoning with Copper.—M. Roncher, in an article upon this subject, in the Gazette Medicale de Strasbourg, draws the following conclusions, from experiments he has made:

1st. The calcined magnesia will arrest entirely the symptoms of poisoning with copper, if it be administered sufficiently soon after the copper has been taken.

2d. That the dose of magnesia necessary to neutralize the salt of copper, is eight grammes of magnesia to one of sulphate of copper.

3d. That as magnesia prevents the formation of the greenish, soluble salt, it is quite probable that it will act as an antidote to all the salts of copper.—*Southern Med. and Surg. Journ., from Revue Medicale, Aug.* 1851.

A New Method for Preventing Fat and Fixed Oils from becoming Rancid. By Charles W. Wright, M. D., of Cincinnati.—In company with one of the early settlers of this part of the United States, the conversation turned upon the history and habits of the Indians formerly living in this valley, and among other things he mentioned the curious manner in which they preserved bear's fat from becoming rancid, of which the following is a brief account: In the early part of winter the fat is removed from the body of the animal and subjected to the *trying-out* process, as it is termed; that is, it is subjected to a degree of heat sufficient to coagulate and separate the azotized matter which subsides to the bottom of the vessel, and the oil is drained off. After this operation is completed, it is melted again with the bark of the slippery elm tree, (*ulmus fulva,*) finely divided, which may be used either in the fresh or dry state. The proportion is about one drachm of the bark to the pound of fat. When these substances are heated together for a few minutes, the bark shrinks and gradually subsides, after which the fat is strained off and put aside for use.

The bark communicates an odor to the fat that is hardly to be distinguished from that of the kernel of the hickory nut.

Thinking this might be turned to account in the preservation of the fatty matters, I subjected many of them to experiment, and in every instance the result was alike successful. One specimen of butter, (an article which it is well known becomes rancid sooner than any other kind of fat,) prepared in this way more than a year ago, is as sweet, and as free from disagreeable odor, as the day it was made, having been exposed all this time to the atmosphere and change of temperature.

Hog's lard may be preserved in the same manner.

This fact will be of much importance in the preparation of cerates and ointments, which can be thus protected from rancidity.

In the lubrication of delicate machinery an acquaintance with this fact may be of benefit by preventing the injury that results from the use of rancid oil.—*Western Lancet.*

Minutes of the College.

At a stated meeting of the Philadelphia College of Pharmacy held 9th month 29th, 1851. Present, 22 members.

Daniel B. Smith, President, in the Chair.

The Minutes of the last stated meeting and of the Board of Trustees were read. From the latter, it appears, that Charles H. Dingee has been elected a Resident member, and Joseph Laidley, of Richmond, Va., an Associate member of the College.

The Committee appointed to examine the subject of members in arrears for annual contributions, reported that they had intercourse with most of those who are accessible, and had generally made settlements with those who were indebted to the College.

The following Resignations were offered with the recommendation of the Committee that they be accepted—viz: Alexander Ardley, Peter Babb, Jacob L. Baker, James H. Crew, Edwin Meredith, Albert S. Letchworth. The Committee further recommended that the following members, several of whom have permanently left the city, be released from membership, viz: Benjamin J. Ritter, Elwood Wilson, Linnæus R. Gilliams, James W. Simes, Franklin R. Smith, Henry W. Gillingham.

The Report of the Committee was accepted, and they discharged from the further consideration of the subject.

A Report from the Committee on Latin Labels was read and accepted.

The resignation of John C. Allen, informing that he had given up the Drug business, and desired to withdraw from membership, was read, accompanied by the required information from the Treasurer that he was not in arrears to the College. Much unwillingness being expressed to part with a member so long associated with the institution, and who had been so useful to it, especially as Chairman of the Committee on Latin Labels, it was unanimously Resolved, as a testimonial of our respect for him, and appreciation of his services, to continue him a member, and to remit in advance all further fees and contributions that would accrue from him to the College.

On motion, Edward Parrish was appointed to the Committee on Latin Labels in place of John C. Allen resigned.

The following Communication from the College of Pharmacy of New York was received and read.

COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

New York, Sept. 9th, 1851.

To the Philadelphia College of Pharmacy.

Gentlemen,—Herewith we have the honor of submitting to you a copy of the Preamble and Resolutions, adopted at a stated meeting of the Board of Trustees, on the 4th inst.

Our College has, upon several occasions during the past year, had under consideration the subject of established and uniform standards for Imported Drugs and Medicines, by which their admission should be regulated alike, at all the ports of the United States. It is evident, that the important law to prevent the importation of adulterated Drugs and Medicines, cannot exert its full salutary effect, unless the best practicable standards of quality are fixed, uniformly demanded, and generally understood.

With the hope of promoting this desired improvement, our College, last spring, made a proposition to the other Colleges of Pharmacy, to meet in convention at New York to consult on the matter, with the object, at that time, of laying such propositions as might be agreed upon, before the National Medical Convention at Charleston. The notice was short, however; and though we received interesting communications from Philadelphia, Baltimore and Boston, yet no delegates from other cities attended. A report, presented by our delegates, was submitted to the National Convention. The proposed establishment of standards was there fully approved; and it was the opinion of that body, that the subject was fitly the province of the Pharmaceutical profession.

Since that time, notices more or less favorable to a convention of the Colleges in the fall, have appeared in several quarters. As the proposal first emanated from New York, it seems, by general consent, to have been left to New York for renewal. In regard to time and place, we have been governed by most of the suggestions we have received from those interested in other quarters. We shall be pleased to hear whether they are acceptable to you, and that we may expect the pleasure of meeting you, and the benefit of your suggestions—the results of your judgment and experience.

The Committee propose that the Convention should meet at 5 o'clock, P.M. (Wednesday, 15th of October,) at the College Rooms, No. 511 Broadway.

Please address,

Yours, very respectfully,

GEO. D. COGGESHALL,

809 Broadway.

On motion, the letter and Resolutions of the New York College of Pharmacy were directed to be entered on the minutes. The merits of the propositions contained therein were fully discussed, and it was thereupon Resolved, to appoint three Delegates to meet the proposed Convention in New York, with power to fill vacancies. Charles Ellis, William Procter, Jr., and Alfred B. Taylor were accordingly appointed.

The semi-annual Election for eight members of the Board of Trustees was held. Jacob L. Smith and Francis Zerman were appointed Tellers; who reported that the following named gentlemen were elected for one year. Thomas P. James, Jacob L. Smith, Alfred B. Taylor, John Harris, M. D., William J. Jenks, Joseph Trimble, Charles Bullock, Henry C. Blair.

Then adjourned.

DILLWYN PARRISH,

Secretary.

Editorial Department.

The Report of a joint Committee of the Philadelphia County Medical Society, and the Philadelphia College of Pharmacy, relative to physician's prescriptions, published in our last number as adopted by the College of Pharmacy, was on the 20th of January unanimously adopted by the County Medical Society with the following *proviso*, viz:

"*That nothing therein contained shall be construed into any sanction or countenance, direct or indirect, on the part of this Society, of the manufacture, sale, or use, by any one under any pretext, of quack or secret medicines.*"

Wild Cherry Bark.—We would call the attention of druggists and apothecaries to the important fact, determined in the essay on Wild Cherry Bark at page 109, that the Autumn is the proper period for collecting this bark, as at that season the proximate principles which give rise to its most important medicinal power, are then most abundantly secreted.

American Narcotic Extracts.—The Essay at page 111, on the Extracts of European Narcotics of American growth, has peculiar interest to the Physicians and Pharmaceutists of this country, and we hope the subject will be continued on a larger scale and during a longer period. We should not be indebted to Europe for these agents, when the material for preparing them is at our doors.

Poisoning by Bichloride of Mercury. *A Broken Staff.*—Dr. C——, of Roxbury, in a communication to the *Boston Medical and Surgical Journal for Feb. 25th*, details the *treatment* in a case of poisoning where the patient, Mrs. T——, had swallowed about a teaspoonful of corrosive sublimate.

It appears that Dr. C——, when called in, was informed that the patient had swallowed the poison, and he at once administered a drachm and a half of sal æratus (impure bicarbonate of potassa) in half a pint of water, the object of which, he observes, "*it will be at once perceived was to form a chemical union of the alkali with the acid of the poison and thus render the mercury comparatively harmless*" (*!*) After repeating this prescription, and finding his patient still vomiting, he directed the *whites of a dozen eggs* to be given as fast as the circumstances would admit, followed by *flour and water.*

We here learn for the first time that such a solution of bicarbonate of potassa will *saturate the acid of corrosive sublimate*, or decompose it immediately in any way so as to produce an inert compound; and we cannot but admire the wisdom displayed by Dr. C. in giving the *real antidotes* along with the spurious one; yet as the suggestion may meet the eyes of other physicians, not more familiar with chemical reactions than its author, and perhaps induce them to waste important time by depending on it, we have felt it a

duty to point out the error, which doubtless has appeared to many other readers of the Boston Journal.

In order that our criticism should be based on more than previous recollection of the subject, a solution prepared as Dr. C. directs was mixed with one of corrosive sublimate, and after 24 hours no evidence of decomposition was apparent, except the deposition of a very minute precipitate of the oxychloride of mercury ($HgCl_2 + HgO$, which requires time for its formation, and which is also poisonous,) the solution affording a copious precipitate of bin-iodide of mercury on adding iodide of potassium. Pearl ash would have decomposed the corrosive sublimate and precipitated it as oxychloride at once, but it would only have rendered the poison less active, and by no means inert.

Art *vs.* Nature.—The philosopher equally with the little child will sometimes swallow sugar plumbs and be deceived by their contents. The Philadelphia World, and perhaps "the rest of mankind," have been dosed with a new order of acidulated sugar drops, purporting to be flavored with essences prepared artificially in a scientific manner by chemical means; whilst enjoying their tangible qualities in the region of the palate, the pleasure of some has been increased by a proud sense of the triumph of Chemistry, in thus vieing with nature in the production of her most agreeable delicacies. To a large extent this feeling is in harmony with truth, as several of the flavors *are solely* the products of the chemist's science and the manufacturer's art, whilst others are jointly the production of nature and art. The so-called *jargonelle pear essence* is obtained by distilling together the oil of grain (a disagreeable residue in the distillation of whiskey) acetate of potash and oil of vitriol, as described at page 38, in our last number. The pine apple flavor is chiefly the butyric ether, an oily liquid obtained by fermenting a mixture of sugar, sour milk, a little old cheese and some chalk in powder, at a temperature of 86° to 93° Fahr. as long as any gas is evolved, say for five or six weeks. During the fermentation the butyric acid which is formed is neutralized by the chalk, and remains in solution as butyrate of lime. This solution is strained, decomposed by the careful addition of carbonate of soda so as to form a butyrate of soda, which remains in solution, whilst carbonate of lime precipitates with some coloring matter;—the solution is then concentrated by careful heat to a semi-syrupy consistance, and distilled with a mixture of sulphuric acid and alcohol to obtain the butyric ether in an impure state. If wanted in a purer state, the impure syrupy butyrate of soda must be distilled with sulphuric acid alone, and the acid thus obtained after saturation with soda, is distilled with sulphuric acid and alcohol.

Butyric ether is remarkable for having what may be termed a *fruity* odor and taste, and it is this quality, modified by the addition of certain other substances that renders it useful for the purposes of the confectioner. For instance, butyric ether and the jargonelle essence (acetate of oxide of amyl)

forms the *banana* flavor—and when modified in other ways produces the artificial strawberry and other flavors. We have noticed that the valerianic aldehyde, which comes over with valerianic acid in the distillation of fusel oil with sulpho-bichromate of potash, has a strong fruity odor which might be taken advantage of in imitating fruit flavors. Pure hyponitric ether is another substance that may be used; and some persons have noticed a resemblance between this ether and the flavor of some varieties of apples. This subject is just opening to the chemist, and will doubtless admit of a considerable expansion. When it is remembered that he can make the delightful teaberry oil (gaultheria procumbens) from wood naphtha and willow bark, and the agreeable perfume of the *meadow sweet* from the bark of the poplar, we should not despair of seeing many other natural productions of this class rivalled in the laboratory.

Fruit essences sold as strawberry, pineapple, apricot, quince, raspberry, green gage, mulberry, black current, &c., and which are used for flavoring syrups, jellies, blanc mange, cordials, etc.—are manufactured in England by Mander, Weaver & Co., of Wolverhampton, and to some extent in this country. Strawberries, raspberries and some other fruits yield an agreeably odorous product by distillation which *may* be capable of concentration. With butyric ether as a base, these products might afford successful imitations of the fruit. always of course using a portion of citric or tartaric acids. Why cannot some of our young pharmaceutists investigate the subject?

Returning to the sugar plumbs, the *lemon, orange, vanilla* and many other flavors are *yet* derived from natural sources, yet even these are said to be much improved by the addition of butyric ether.

Doctor Weddell.—From an interesting paper on the present condition of botanical literature, by Professor A. Gray, in Silliman's Journal, for January, 1852, we learn that Dr. Weddell, whose reputation as the author of the best monograph on the Cinchonas of Peru that has yet appeared, has again returned to South America to continue his explorations in the same regions. The success attending his first visit is an earnest of a rich contribution to medical botany, should this talented gentleman be favored to return safely to his adopted country. Dr. W. is an Englishman by birth, but is now one of the aid-naturalists of the *Jardin des Plantes.*

Pharmacy in Richmond, Va.—We learn from the *Stethoscope* that all but two of the druggists and apothecaries of Richmond have agreed to subscribe to the code of ethics promulgated by the Richmond Medical Society—which code closely resembles that of the Philadelphia College of Pharmacy. We hail this as the beginning of a new order of things in the Virginian metropolis, and hope that steps will be taken to form a society of apothecaries before the meeting of the Convention in October. A number of young gentlemen from Virginia have graduated at our College with marked credit, and it will not be surprising if ere many years, some of the staunchest

columns of our Professional Edifice should arise from the cities of the Old Dominion.

Pharmacy in Louisville.—Louisville is one of the medical and pharmaceutical centres of the Great West. We are informed that the druggists and apothecaries of that city are on the eve of forming an association, also that the condition of the practice of pharmacy has very much advanced within a few years. To our brethren of Louisville, as to those of every American city, where associations do not exist, we would say:—Institute a Society; the amount of private interests that will have to be surrendered will not amount to a tythe of the benefits accruing to the members when such associations acquire solidity, by a few years experience.

Convention of 1852. What steps have been taken?—Nearly six months have passed since the meeting of the New York Convention in October last; six months more will bring us to the period of the proposed gathering, and it is entirely proper to put the query—*What has been done to promote the object in view?* We are not disposed to believe that, with the most favorable happening, an instantaneous change can be wrought in the condition of our professional ranks; but we *are* prepared to avow the opinion that the character and actions of the ensuing Convention, small though it may be, will very much influence the future movements arising from them, and that delegates should be chosen whose experience, ability, and disinterested sympathy for the Profession, will induce them to place their best powers at the service of the Convention.

The important questions for deliberation are not personal: individual honors, and love of popularity, are too apt on such occasions to obtrude themselves into the foreground: but they are such as these:—1. By what means can the existing large number of ill qualified practicing pharmaceutists, every where over our country, be induced to improve themselves in education, or in the ability to give better service in their several spheres of action, without omitting their present duties? 2. What are the most efficient and best adapted means by which our apprentices,—the pharmaceutists of the future,—can receive the benefits of pharmaceutical education. 3. How far will the principle of association enable the better qualified to extend assistance to the deficient? 4. What means are best calculated to sever the existing connection between pharmacy and quackery, and to induce apothecaries to repudiate the sale of secret remedies? And lastly what suggestions can be offered to the Convention, by which it may hold out inducements sufficient to engage and direct the latent talent of our ranks, to such useful and interesting scientific objects as shall redound to the improvement of our profession at home, and its reputation abroad?

These are a few of the questions, which will naturally present themselves before the earnest delegate, and to the solution of which he will bring his

best exertions. The Communication at page 133 will be read with interest; it is an indication that the subject is engaging attention. Our columns are open to all who desire to be heard, and we would invite our brethren at a distance to use them if they have aught to suggest or to enquire.

Extracts Prepared in Vacuo.—We have received a communication from the Messrs. Tilden, in reference to a paragraph in our notice of the Shaker establishment at New Lebanon, published in the January number of the Journal, calling in question the correctness of the statement. We are not disposed to throw our columns open to the controversy of rival manufacturers, yet as the statement involves to some extent the priority of application of an important improvement in the manufacture of extracts, we will publish so much of the communication as is necessary to set the claims of the authors in a clear position.

To the Editor of the American Journal of Pharmacy

Our attention has been called to the following extract from a communication to you by M. Fowler, of the Society of Shakers at New Lebanon, N.Y., published in your Journal of January 1852. page 90.

"As not a member of our community had the *least* knowledge that medical extracts had ever been manufactured in America by that process at the time our apparatus was built."

The public are here explicitly informed that not a member of their community had the *least knowledge* that medicinal extracts were prepared in vacuo in this country, at the time the apparatus was built, to which they refer. Are we to infer that to them belongs the credit of being the first to employ it in this country?

We owe it alike to yourself, and the public, to expose the mistatements of their article, as well as to ourselves, to place upon record, as a matter of history, the facts connected with the erection of the first vacuum apparatus in this country, for the manufacture of extracts upon an extensive scale. While engaged in the preparation of medicinal extracts in the ordinary mode, our attention was called by gentlemen of science to the general inertness of such preparations, which led to a thorough investigation of the subject, and a determination to commence their preparation in vacuo. We examined all the many plans and inventions in use for other similar arts, and late in the fall of 1847 matured the plan now in use by us; the ensuing winter and spring, (1848) was occupied in the erection of our manufactory; and the summer, in the erection of the apparatus and machinery; the remainder in experiments; producing only a few hundred pounds. In the spring of 1849, we started our works into successful operation, and continued so until December, producing several thousand pounds of extracts. The apparatus not being of sufficient capacity, we made, during the winter of 1849—50, additions increasing its capacity five-fold. In April of 1850 we started our works and continued in operation until the winter when we again suspended operations for a month, to make further alterations in the apparatus; since that time our works have been in almost constant operation, making from that time nearly twenty thousand pounds of extracts.

The [Shaker] family referred to is within about a mile of our manufactory at New Lebanon, situated upon a hill overlooking it, and almost daily some of the family pass by. It was well known at New Lebanon and in this city that the extracts we were preparing, and putting up in an entirely different style,

were made in vacuo; they were the subject of comment and commendation by the profession of this city, as well as by druggists generally.

Messrs. Tilden further observe, that "while our manufactory was in process of erection, members from the family of M. Fowler visited our works, and knew we were engaging in the manufacture of extracts by a 'new process,' because they saw the apparatus, and made inquiries in regard to it and our manipulations, both before and after the erection of *their* apparatus, which occurred in the summer of 1850."

Soluble Citrate of Magnesia.—It should have been stated among other processes for obtaining soluble citrate of magnesia, at page 113, that when an aqueous solution of that salt is thrown into a large excess of alcohol, and rapidly agitated, the citrate is precipitated, deprived of most of its water, and may be separated and dried by a moderate heat, so as to remain soluble and neutral, the excess of acid being held in solution by the alcohol. In point of economy there is an objection to this mode of preparing the salt.

New York Journal of Pharmacy.—We have received the three first numbers of this periodical, which was announced in our last issue as about to be published under the auspices of the New York College of Pharmacy, with Prof. McCready for its Editor.

From the introductory chapter, we learn that New York is the commercial centre, the wealthiest and most populous city in the Union, possessing advantages of communication with foreign countries, and with other parts of our own country, unequalled by any other city; and moreover embracing within her borders several hundred apothecaries, among whom are many of great experience and eminent ability. From these premises it is argued she should also possess a Journal of Pharmacy; by which the observations of her pharmaceutists may become known to the world, and not lost, or retained within the precincts of the shop, as till now; and by which the younger members may be stimulated to give more attention to the scientific department of their art.

The numbers before us are of 32 pages, octavo, each, neatly printed on good paper, and altogether presenting a substantial and well began *physique.* Each number embraces several original articles, three of which have been transferred to our pages, and our readers will perceive that they have a practical aim.

From its expression thus far, it requires no reflection to decide that the tendency of the New York Journal will be favorable to the advancement of pharmacy, that it will oppose quackery and ignorance in our professional ranks, as well as at large, and that it will advocate a high standard of professional conduct. Thus impressed in regard to her, it is with a hearty good will that we tender the right hand of fellowship to our New York sister, and wish her success.

An Address on the occasion of the Centennial Celebration of the founding of the Pennsylvania Hospital, delivered June 10th. 1851. By GEORGE B. WOOD, M. D. Published by the Board of Managers. Philadelphia, 1851. pp. 141.

Rarely have we seen the history of a public institution so clearly, concisely and unostentatiously delineated, where the subject involved interests so important, and a period so extended in the past, as in this address of Dr. Wood. We have finished its perusal with a far better understanding of the origin, progress, and present position of the Pennsylvania Hospital, than ever before, albeit our opportunities have not been deficient. We believe every reader will have to acknowledge the debt due to our fathers, when he learns, through the interesting pages of this Address, the wide reaching benevolence which this Hospital, their bequest to us, is annually extending to hundreds of the maimed, the insane and the sick poor, restoring them to their families without cost, or charge; and whilst thus directly beneficial, (as the author justly observes,) thousands of the afflicted in distant places derive indirect relief, from the lessons there received, and the experience there gained by the numerous Graduates of Medicine who every season witness the treatment, and listen to the clinical instruction within its walls.

An appendix to the Address embraces the Charter, and By-laws, and lists of the Managers, Physicians, Contributors, etc. who have been connected with the Institution by service or contribution since its commencement, with the terms of service of each, and amount contributed by each of the latter.

The volume, is illustrated with two well executed engravings, the Hospital buildings in the City, and those of the Insane Department west of the Schuylkill, and a figure of the statue of Penn, is impressed on the cover.

A Notice of the Origin, Progress, and Present Condition of the Academy of Natural Sciences of Philadelphia. By W. S. W. RUSCHENBERGER, Surgeon U. S. Navy. *Read before the Society Feb. 10th*, 1852. pp. 78, octavo.

The work, of which the above constitutes the title page, is now before us, through the politeness of the author. Without claiming any pretensions to a regular history of science, it succinctly sets forth how it has happened that, within the last forty years, a scientific institution of very considerable magnitude, whether measured by the ability of its members, or the volume and value of its collections, has grown up within our city, without one dollar's contribution from the Municipal, or State, or National Government, through the untiring zeal of the votaries of science, assisted by the munificence of private patrons, until now, when its transactions have a European circulation, and, in some respects, its museum may vie with the noblest government-supported accumulations of Europe.

The museum embraces 148,876 specimens of natural history, whilst the library, which includes a most valuable collection of works on natural science, periodical and special, numbers 13,382 volumes. "The collection of birds, which is exhibited in the principal hall of the Academy, has grown

to be the most extensive, and the very best in the world," through the aid of many naturalists both American and Foreign, but most especially through the liberality of Dr. T. B. Wilson, whose contributions, by purchase, to this department alone, amount to more than 16,000 specimens, including the celebrated Rivoli collection formerly at Paris.

We have not space to enter into the very interesting particulars of the origin and progress of the Academy, an inability that we regret the less, since learning that the work of Dr. Ruschenberger can be procured at the Hall of the Academy.

Every American, and especially every Philadelphian, should be proud of this Institution, and should embrace every opportunity to add to its collections, remembering that scientific benefits are of universal application, and that, in the estimation of the naturalist, every production of nature has a value. There are many intelligent sea-captains, whom this account would stimulate to take advantage of the valuable opportunities that foreign voyages afford to make collections of natural objects, and we are glad to see that, among the numerous officers of the Navy, there are some instances of laudable zeal in this disinterested benevolence.

Review of Materia Medica for the use of Students. By John B. Biddle, M. D., of Philadelphia. *With Illustrations.* Philadelphia: Lindsay & Blakiston, 1852; pp. 322, 12mo.

This volume is intended to assist the Medical Student in grasping the numerous important details of a prominent branch of his studies, by presenting the most important facts and principles, in a concise, clear, and explicit manner, so that after having applied himself, in his more leisure seasons, to the larger treatises, he can in a rapid and effectual manner recall directly before his minds eye the more important features of the subject, and indirectly, by association, the less striking facts.

From a general examination of the book, we believe this object has been accomplished with more than usual success, and that it will prove in practice a useful auxiliary to those for whom it is intended. It has the *merit* of not being so full as to induce the indolent to depend on *it alone*, and yet it is sufficiently comprehensive to serve as a valuable aid.

The Pocket Formulary, and Synopsis of the British and Foreign Pharmacopeias, comprising Standard and Approved Formulæ for the Preparations and Compounds employed in Medical Practice. By Henry Beasley. *First American, from the last London edition, corrected, improved and enlarged.* Philadelphia: Lindsay & Blakiston, 1852; pp. 443. 12mo.

If the American Physician and Apothecary is not well posted up with recipes of all kinds, and all qualities, it is not the fault of the publishers. The real or apparent utilitarian tendency of such works, addresses itself to a large class of persons who wish to read with *profit*, not so much to their

understandings as to their pockets. The disposition of many practitioners of medicine to patronize the *new*, is a fruitful source of patronage to formularies and receipt books, especially by apothecaries, who, in addition to the desire to meet this *penchant* of the physician, have in view *new articles* addressed directly to the people, whether of medical or economical importance.

The formulary of Dr. Beasley, however, has, if we may use the expression, entirely a *pharmaceutico-therapeutical* direction, embracing, besides the authorized formulæ of the Pharmacopœias, numerous recipes for permanent and extemporaneous preparations, derived from various sources, which may often prove useful. Those who are unprovided with such a work will find this a useful addition to their books for constant reference.

Ranking's Half-Yearly Abstract of the Medical Sciences. No. 14. July to December, 1851. Philadelphia: Lindsay & Blakiston. pp. 296. 8vo.

We have received this comprehensive periodical from the publishers. As it is addressed almost entirely to the physician, it does not become us to speak critically of its value ; a cursory glance at its contents, however, has induced the impression that its pages contain much useful information, interesting to the medical practitioner who does not receive a large income of periodical medical literature.

Physiological Chemistry. By Professor C. G. LEHMANN. Vol. 1. *Translated from the second edition* by GEORGE E. DAY, F. R. S. &c. London 1851. pp. 455. octavo. Printed for the Cavendish Society.

The volume of Dr. Lehmann's chemistry constitutes the first of the volumes for 1851- the second (6th vol. Gmelin's Chemistry) not having yet appeared. We will defer a notice of the work until our next issue, when it is proposed to give a sketch of the whole series of the Cavendish publications.

PHILADELPHIA COLLEGE OF PHARMACY.

At the Annual Examination of the School of Pharmacy, the following named gentlemen, having complied with the Rules of the College, and having passed a satisfactory examination by the Professors and Examining Committee, were declared, by the Board of Trustees, Graduates in Pharmacy.

Graduating Class.		*Subject of Thesis.*
Baker, T. Roberts	Virginia,	Secale Cornutum.
Burton, David F.	Delaware,	Stillingia Sylvatica.
Canedo, Cipriano	Mexico,	Imperatoria Ostruthium.
Davis, John L.	Philadelphia,	Chimaphila.
Gormly, George M.	Virginia,	Progress of Chemistry.
Hendel, Samuel D.	Philadelphia,	Geranium Maculatum.
Heyser, William	Pennsylvania,	Cornus Florida.
Holden, John	Pennsylvania,	Arctostaphylos Uva Ursi.
Jones, Alfred	Philadelphia,	Narcotic Plants of U. S.
Morris, J. H. M.	Kentucky,	Frasera.
Peltz, Richard	Philadelphia,	Syrup of Assafetida.
Perot, Joseph S.	Philadelphia,	Cortex Pruni Virginianæ.
Ritter, Bradford	Philadelphia,	Iron
Selfridge, Mathew M.	Pennsylvania,	Kalmia Latifolia.

The Annual Commencement of the College was held on Thursday evening, (March 18th) at eight o'clock, in the Sansom Street Hall, on which occasion the Degree of Graduate in Pharmacy was publicly conferred by Thomas P. James, Esq., Chairman of the Board of Trustees, on the successful candidates, in the presence of a large and respectable audience.

The Valedictory Address was delivered by Prof. William Procter, Jr.

A. B. TAYLOR,
Secretary of Board of Trustees.

A CATALOGUE OF THE STUDENTS

CONSTITUTING THE CLASS OF THE

PHILADELPHIA COLLEGE OF PHARMACY,

For the Session of 1851–2.

Agnew, Henry	Philadelphia,	Penn sylvania.
Alexander, Maurice W.	"	"
Bachman, Alexander,	"	"
Baker, Charles	"	"
Baker, T. Roberts,	Richmond,	Virginia.
Balliet, Louis	Lehigh Co.	Pennsylvania.
Barclay, James S.		Kentucky.
Beck, Abraham R.	Litiz,	Pennsylvania.
Bispham, J. L.	Philadelphia,	"
Bonsall, Charles T.	Trenton,	New Jersey.
Bower, Henry	Morrisville,	Pennsylvanla.
Buck, Charles E.	Philadelphia,	"
Burton, David F.	Dover,	Delaware.
Caldwell, Jr., Samuel W.	Philadelphia,	Pennsylvania.
Canedo, Cipriano	Mexico.	
Conyers, James R.	Philadelphia,	Pennsylvania.
Corbett, John	"	"
Davis, John L.	"	"
Detwiller, John J.	Northampton,	"
Dieffenbacher, Calvin O.		"
Downs, Michael J.	Philadelphia,	"
Doret, Augustus M.	New York,	New York.
Douty, Henry P.	Philadelphia,	Pennsylvania.
Edwards, Wm. H.	"	"
Eggert, Charles H.	Bethlehem,	"
Emanuel Louis M.	Delaware Co.	"
Evans, Lemuel L.	Montgomeryville,	"
Farr, James M.	Philadelphia,	"
Franks, Edward G.	Lewistown,	"
Gahan, Edward J.	Dublin,	Ireland.
Gaillard, E.	Philadelphia,	Pennsylvania.
Gormly, George M.		Virginia.
Griffith, William H.	Philadelphia,	Pennsylvania.
Gutekunst, Frederick	Germantown,	"
Hance, Edward	Philadelphia,	"
Harper, David	Shippensburg,	"
Harres, J. Henry	Philadelphia,	"
Hartman, Wm. B.	Malaga,	New Jersey.
Hendel, Samuel D.	Philadelphsa,	Pennsylvania.
Herndon, James	Winchester,	Kentucky.
Heyser, William	Chambersburg,	Pennsylvania.
Holden, John	Frankford,	"
Hooper, John H.	Cambridge,	Maryland.
Humburg, William G.	Philadelphia,	Pennsylvania.
Humphreys, Jesse B.	Montgomery,	"
Jenks, J. Ridgeway,	Bucks Co.	"

Jones, Alfred	Philadelphia,	Pennsylvania.
Jones, Tobias W.	"	"
Jones, William		Ireland.
Kerlin, Frederick E.	Chester,	Pennsylvania.
Leuchsening, Herman	Havana,	Cuba.
Mansfield, Michael	Philadelphia,	Peunsylvania.
Mitchell, Alexander	"	"
Moore, Robert	Baltimore,	Maryland.
Morgan, David U.	Philadelphia,	Pennsylvania.
Morris, J. H. M.	Louisville,	Kentucky.
Ogden, Edward H.	Philadelphia,	Pennsylvania.
Patterson, William M.	"	"
Peltz, Richard	"	"
Perot, Joseph S.	"	"
Rittenhouse, Henry N.	"	"
Ritter, Bradford	"	"
Rogers, Charles S.	Norfolk,	Virginia.
Ruch, John H.	Pottsville,	Pennsylvania.
Savery, Jr., William	Philadelphia,	"
Selfridge, Matthew M.	Allentown,	"
Sharswood, J.	Philadelphia,	"
Sheaff, John F.	Delaware C.,	"
Shinn, James T.	Philadelphia,	"
Shrom, Charles F.	Carlisle,	"
Smith, Mahlon K.	Salfordville,	"
Southall, Turner H.	Norfolk,	Virginia.
Stackhouse, David L.	Bucks C.,	Pennsylvania.
Stevens, Hennell	Philadelphia,	"
Stoeckel, George W.	"	"
Thomas, Jesse J.	Beverly,	Rhode Island.
Thompson, Wm. B.	Philadelphia,	Pennsylvania.
Thompson, Wm. H.	"	"
Tomlinson, E.	"	"
Uhler, Jonathan K.	"	"
Verner, Chittick		Ireland.
Walker, Wm. H.	Waynesboro,	Pennsylvania.
Walters, Joseph P.	Philadelphia,	"
Watson, William S.	"	"
Willitts, Charles J.	Burlington,	New Jersey.
Wolff, Wm. H.	Philadelphia,	Pennsylvania.
Ziegler, Henry S.	Salfordville,	"

THE

AMERICAN JOURNAL OF PHARMACY

JULY, 1852.

ON ERYTHROPHLEUM JUDICIALE, (THE SASSY BARK TREE OF CAPE PALMAS.)

By William Procter, Jr.

The first paper on this subject, published at page 301, vol. xxiii. of this Journal, was necessarily imperfect in its botanical relations, owing to the flowers of the plant not being among the specimens on which the account was based, the tree being in fruit at the time they were collected. Since then I have received from Dr. McGill, through Moses Sheppard, Esq., of Baltimore, several very perfect specimens of the inflorescence of the Sassy bark tree, preserved in diluted alcohol, by which its characters have been studied, and are presented in the following essay.

After a careful examination of accessible works on the botany of Western Africa, no further accounts of the Sassy tree or allied trees have been found, than those mentioned in the first essay. Neither Endlicher, Lindley, nor Don, who give the generic characters of Erythrophleum, (Afz.) mention any species, or give the specific characters of any of them.

The *Red water tree* of Sierra Leone, first noticed by Winterbottom in his account of that colony, (vol. i. p. 129,) was afterwards noticed by Professor Afzelius, who resided several years in that region, and was erected into a new genus Erythrophleum* distinct

* From the red color of the bark.

from Inga, to which genus it and several allied species had been referred. Robert Brown, in his botanical appendix to Tuckey's narrative of an expedition to Congo, p. 467, states that "the ordeal tree noticed in Professor Smith's journal under the name of cassa, and in captain Tuckey's narrative, erroneously called a species of cassia, if not absolutely the same plant as the *red water tree* of Sierra Leone, and as it is said of the Gold Coast, belongs at least to the same genus." Mr. Brown further states, in speaking of the leguminous plants of the Congo expedition, "Of the second order Cæsalpineæ, the collection contains nineteen species, among which are four unpublished genera. One of these is Erythrophleum of Afzelius, the *red water tree* of Sierra Leone, another species of which genus is the ordeal plant or *cassa* of the natives of Congo."

In subsequently describing the plants collected by Denham and Clapperton, (see Brown's appendix to D. and C.'s travels, p. 234,) Mr. Brown observes, that several leguminous plants have been discovered in western Africa with the clubshaped spike, which have characters fully sufficient to distinguish them from Inga, to which they had hitherto been referred. These plants have been classed together, the type of the tribe being the genus Parkia, one of the most striking and beautiful of equinoxtial Africa, so named by Mr. Brown, "as a tribute to the memory of the celebrated traveller." Mr. Brown further says, "I have formerly endeavored to distinguish mimoseæ from cæsalpineæ, by the valvular æstivation of its floral envelopes, and by the hypogynous insertion of its stamens. Instances of perigynous insertion of stamens have since been noticed by MM. Kunth and Auguste St. Hilaire."

"Erythrophleum, another genus indigenous to equinoctial Africa, which I have elsewhere had occasion to notice (vid. ante) and there referred to cæsalpineæ, more properly belongs to mimoseæ, *although its stamens are perigynous.* In this genus, both calyx and corolla are perfectly regular, and their æstivation if not strictly valvular, is at least manifestly imbricate, though the flower buds are neither acute nor angular. In Erythrophleum and Parkia, therefore, exceptions to all the assumed characters of mimoseæ are found, and there is some approach in both genera to cæsalpineæ."

A careful study of the specimens from Cape Palmas, in view

of the facts contained in the above quotations, has led to the opinion that the Sassy bark tree is not only an Erythrophleum, as supposed in my former essay, but closely resembles the *Red water tree* of Sierra Leone, as supposed by R. Brown in reference to the ordeal plant of Congo. The reasons for this belief, in the absence of the specific characters of the Sierra Leone tree, are, the proximity of Cape Palmas to the latter colony, the similar application of its bark as an ordeal, and its strong coloring power when infused in water, which property has given name to the Sierra Leone plant. On the other hand, the alternate position of the folioles of the sassy tree, whilst those of the red water tree are opposite, render their identity at least doubtful.

As no specific name has been given to the red water tree—and as the sassy bark tree may be identical, I have called it Erythrophleum *judiciale*, in reference to its use by the natives.

ERYTHROPHLEUM, *Afz.*—Natural order, FABACEÆ; sub order, MIMOSEÆ, and tribe, PARKIEÆ, of Lindley.

Generic characters.—*Flowers*, hermaphrodite, regular. *Calyx*, five-limbed, subimbricated. *Corolla*, five petals. *Stamens*, perigynous. *Legume*, compressed, bivalved, and many seeded. (*Endlicher, Gen. Plant*, p. 1323). They are tall tropical African trees, with bi-pinnate leaves, opposite folioles, flowering in terminal and lateral racemes.

Erythrophleum judiciale, is a large tree with numerous spreading branches, the latter covered with a smooth bark, greyish colored externally, whilst on the trunk and larger branches the bark is rough, corrugated and fissured, and has a ferruginous red color, with light colored excrescences. The *leaves* are bi-pinnated: the pinnæ are articulated oppositely on the general petiole, and vary from three to six or seven pairs, according as they are taken from near the flowering terminus of a branch, or below. The terminal pinnæ are longer, and the folioles larger, than those near the base of the leaf. The *leaflets* are sub-petiolate, obliquely ovate and acuminate, from one to three inches long, alternate or in pairs nearly opposite, smooth, entire, coriaceous, and varying from three to five or six on a side. The bark of the twigs and younger branches is covered with light colored dots, which extend to the bases of the peduncles and petioles. *Inflorescence.*—The sassy tree flowers in compound spike-like racemes; that is to say, all the

terminal buds, often thirty or forty, develope as flower buds, each producing a raceme, so as to form large panicles. The spikes or racemes which are articulated with the branched flower-stems, vary in length from three to six inches, and when the flowers are fully expanded, are from six to eight lines in diameter. The peduncles are cylindrical and fluted, and the flowers are arranged around them on short pedicels, about half a line to a line in length, varying from one hundred to four hundred in number. Their close arrangement, short pedicels and exsert stamens, give them somewhat the aspect of the catkins of some amentaceæ. The florets expand nearly equally, which gives to the inflorescence of the sassy, a graceful and plume-like aspect. Flowers.—*Calyx* regular, cup-shaped, five-cleft, tomentose externally. (See Fig. 1 *a b*.) *Corolla*, valvate in expanding, petals five, oblong obovate, very tomentose exteriorly, alternate with the limbs of the calyx. (*a c*.) *Stamens* ten, perigynous, exsert, inserted on either side of the petals, (*c*) filaments cylindrical, smooth, twice the length of the petals, anthers ovoid, two-lobed, yellow, and dehisce longitudinally. At the base of the petals and surrounding the pistil are five glands (*b*) about the size of the anthers. *Pistil.*—The pistil projects beyond the corol la, (*a b*) is as long as the stamens, and consists of an elongated very tomentose ovary, the woolly covering of which increases its diameter one half; and a stigma sessile, conical, smooth, about one sixth as long as the ovary, and furnished at top with a round foramen. When sliced longitudinally the ovules are visible. (*d*) *Legumes*, from two to four inches long, and from one to two wide, violin shaped, chestnut colored, coriaceous, compressed, obtuse at both ends when fully developed, bivalved, two to five-seeded, and dehisce by the dorsal suture. *Seeds* have an oblong oval flattened shape, are black, and covered with a very gummy transparent substance, analogous to cerasin. The episperm is hard and horny, enclosing a tough hard light grey albumen, nearly surrounding the cotyledons, which are compressed, indurated and of a yellowish green color.

One of the features of this species Erythrophleum, is the sparsity of fruit compared with the abundance of inflorescence, as may be observed by comparing figures 1 and 2. The former represents but one branch of a terminal panicle of flowers; the latter, all the fruit of the whole panicle that reached maturity. This habit is quite common, however, as noticed

Fig 1.

a. A perfect flower. *b*. Calyx spread open, showing the pistil and nectaries. *c*. Flower spread open and pistil removed, with the position of two of the stamens exhibited. *d*. Section of the pistil.

Fig. 2.

in the horse chestnut, and other American trees. The remark of Mr. Brown in reference to the æstivation of Erythrophleum and Parkia, is true of this species; on a few of the spikes, the terminal flowers had not expanded, others but partially so, with the stigma protruding, in which the valvate relationship of the petals was sufficiently apparent.

The chemical researches relative to the active principle of the bark have not been resumed at this time, but may be continued on another occasion. In illustration of the singular use to which sassy bark is put by the natives, the following quotation from Winterbottom's Sierra Leone, (page 129, vol. i.) may prove interesting.

"Upon the Gold Coast, the ordeal consists in chewing the bark, with the prayer that it may cause his [the accused] death, if he be not innocent. In the neighborhood of Sierra Leone, the most usual mode of trial resembles that by bitter water, formerly in use among the Jews, and is called *red water* by the Africans.

"The red water is prepared by infusing the bark of a tree, called by the Bulloms, *kwon*, by the Timmanees, *okwon*, and by the Soosoos, *millee*, in water to which it imparts a powerfully emetic and sometimes purgative quality. In some instances it has proved immediately fatal, which leads to a suspicion, that occasionally some other addition must be made to it, as it does not appear that the delicate are more liable to be thus violently affected by it than the robust. To prevent, however, any suspicion of improper conduct, the red water is always administered in the most public manner in the open air, and in the midst of a large concourse of people, who, upon these solemn occasions, never fail to assemble from all quarters, particularly the women, to whom it affords as good an opportunity of displaying their finery and taste in dress, as a country wake in England does to the neighboring females. The accused is placed on a kind of stool three feet high, one hand being held up, and the other on his thigh, and beneath the seat are spread a number of fresh plantain leaves. A circle of about seven or eight feet in diameter is formed around the prisoner, and no one is admitted within it but the person who prepares the red water. The bark is publicly exposed, to show that it is genuine. The operator first washes his own hands, and then the bark, as well the mortar and pestle with which it is to be powdered, to prove that nothing improper is concealed therein. When powdered, a calabash full is

mixed in a large brass-panful of water, and is stirred quickly with a kind of whisk, until covered with a froth like a lather of soap. A variety of ceremonies and prayers are performed at the same time, and the accused is repeatedly and solemnly desired to confess the crime with which he has been charged. A little before he begins to drink the infusion, he is obliged to wash his mouth and spit the water out to show that he has nothing concealed in it; a little rice or piece of kola is then given him to eat, being the only substance he is allowed to take for twelve hours previous to the trial; and in order to prevent his obtaining anything else, he is narrowly watched by a number of people, who are responsible for his conduct. After having repeated a prayer dictated to him, which contains an imprecation upon himself if he be guilty, the red water is administered to him in a calabash capable of holding about half a pint, which he empties eight, ten, or a dozen times successively as quick as it can be filled. It probably now begins to exert its emetic powers, but he must, notwithstanding, persist in drinking, until the rice or kola be brought up, which is easily seen upon the plantain leaves spread below. Should vomiting not be caused, and the medicine produce purgative effects, the person is condemned immediately; or if it be suspected that the whole of what he has eaten is not brought up he is permitted to retire, but with this reserve, that if the medicine produce no effect on his bowels until next day at the same hour, he is then and not before pronounced innocent, otherwise he is pronounced guilty. When the red water proves purgative, it is termed 'spoiling the red water.' The utmost quantity which may be swallowed is sixteen calabashfuls; if these have not the desired effect, the prisoner is not allowed to take any more. When neither vomiting or purging are produced, the red water causes violent pains in the bowels, which are considered as marks of guilt. In such cases they endeavor to recover the patient by exciting vomiting, and to sheath the acrimony of the red water they give him raw eggs to swallow. In some instances, the person has died after drinking the fourth calabash.

"When the accused is permitted to leave the tripod upon which he is seated, he is ordered to move his arms and legs to show that he has not lost the use of them. When he dies upon the spot, which frequently happens, or when the red water is *spoiled*, and the party is too old to sell, one of his family, unless he can redeem himself with a slave, is taken and sold."

REACTION BETWEEN IODINE AND THE ESSENTIAL OILS.

By G. W. Patterson, M. D.,
Resident Physician of the Northern Dispensary.

Having had occasion, recently, to prepare an ointment of *Iodide of Sulphur*, I was surprised to find on adding a drop of oil of bergamot to the iodide previously pulverised, that a rapid interchange of elements ensued, accompanied with an evolution of the violet vapor of iodine, and the odor of sulphur. Upon subsequently experimenting with other essential oils, I found that oil of juniper, savine, caraway, valerian, and lemon, produced a similar effect when added to that iodide. I furthermore ascertained, that none of the other iodides were perceptibly affected by the essential oils.

On adding oil of lemon, bergamot and turpentine, to iodine alone, a phenomenon ensued resembling that produced when iodide of sulphur was acted upon.

I do not know that this incompatibility between iodine and the volatile oils has heretofore been noticed, and although it may be considered of no great practical importance, still it is something interesting.*

It happens occasionally, that although certain medicinal agents are chemically incompatible with each other, nevertheless the medical quality desired is not lost by such combinations, as may be instanced by the collyrium which was at one time much employed, and which consisted of sulphate of zinc, acetate of lead, and water. The mistura ferri comp. of our Pharmacopœia, is also an instance of the kind referred to.

But when substances are combined, capable of undergoing such change as to render the combination unfit to meet the therapeutical indication of a case, the physician must be disappointed, and confidence in medicine destroyed.

*[Note by Editor.—The reaction between iodine and the volatile oils is noticed by Liebig, (*Chimie Organique*, tome. ii p. 309, 1842,) where he remarks, "All the essential oils put in contact with iodine, produce a kind of explosion, in which the oils yield hydrogen to the iodine at the same time that a part of the iodine takes the place of the eliminated hydrogen." It is this sudden evolution of gas that causes the explosion, whilst the heat consequent upon the reaction, vaporizes a portion of the iodine. M. Zeller (*Jahrbuch für Praktische Pharm., Juli,* 1849,) has taken advantage of this

property of iodine, as a means for detecting adulterations, in quite a list of the volatile oils, founded on the fact that this element reacts with very different degrees of rapidity with different oils. We are not aware that the reaction has been noticed before in relation to the iodide of sulphur. At first we supposed, that Dr. Patterson had inadvertently used an iodide partially decomposed, but on repeating the experiment with some recently prepared, the same phenomenon occurred. The very loose state of combination of the elements of this salt, may account for its ready decomposition in the presence of certain volatile oils.]

ON AN EXPEDITIOUS METHOD OF PREPARING PILULÆ HYDRARGYRI.

By James Beatson,

Apothecary U. S. Naval Hospital, New York Station.

The minute division of the mercury in this preparation, is generally looked upon as an index to its therapeutic effects, and in order to accomplish this, various kinds of machinery have been employed.

By a very slight modification of the formula, I have found the pestle and mortar sufficient for supplying all our demands. I have used it for many years, and it has given me the most satisfactory results:

℞.	Hydrargyri	℥xxxij.
	Mellis Despumati	℥vj.
	Aquæ Rosæ	f℥viij.
	Sacchari	℥xxx.
	Rosæ Gallicæ pulv.	℥iv.
	Glycyrrhizæ pulv.	℥xvj.

The proportion of honey, rose water, sugar, and rose petals, corresponds with the officinal formula for "Confectio Rosæ," but instead of mixing the mercury with the confection thus prepared, I triturate the mercury with the honey until the former is completely extinguished; I then heat the rose water, add it along with the sugar, continue the trituration, and then add the powdered rose petals and liquorice root in succession.

I thus have a uniform mass, of one third mercury, perfectly extinguished, and with a very trifling amount of labor.

ON THE CHLORINE LAMP OF DR. HILDRETH.

By William Hodgson, Jr.

In the "Boston Medical and Surgical Journal, Feb. 11th," is a notice by Dr. Hildreth, of a method of eliminating chlorine, which appears to possess some interest. He says:

"Having recently had occasion for the use of chlorine as a disinfecting agent, I was led to consider whether there might not be some method more convenient and efficacious than that usually adopted for its evolution. Though the gas extricated by the new method is not chlorine, but chiefly hydrochloric acid, yet it seems practically of at least equal efficiency for deodorizing purposes.

"Chlorine is usually generated by the action of sulphuric acid upon a mixture of binoxide of manganese and chloride of sodium; by the action of the same agent upon the chlorides of lime or soda; or by the simple exposure of the latter in open vessels. If, in the first process, the binoxide of manganese be omitted, hydrochloric acid is evolved; this latter method is in popular use. Even where the manganese is present, much hydrochloric acid is given off, and if pure chlorine be desired, manganese and sulphuric acid only should be used. In either process the application of heat is necessary.

"The first of these methods is inconvenient, and requires considerable attention. By the second, the gas is rapidly liberated, but the supply is soon exhausted, and the materials must soon be replenished. The third is simple and convenient, but not sufficiently efficacious.

"The plan which I propose is simple and efficient. It consists in the combustion of chloric ether in a common lamp.

"The gas arising from the decomposition of the ether has been analyzed by Dr. Bacon, and found to be hydrochloric acid, with a trace of chlorine. Practically, I have not found it less efficacious than pure chlorine for disinfecting purposes. It has been used to a considerable extent in the Massachusetts General Hospital, and gives no inconvenience to the patients. Its odor may be plainly perceived upon entering a ward where the lamp is burning, and in proper quantity it is far from disagreeable. So far as has been observed, it exerts no injurious influence upon the furniture or metallic utensils in the wards. Its deodorizing powers are fully equal to those of chlorine.

"For purifying the wards of hospitals, or the private apartments of the sick; for deodorization during an autopsy in a private house; for use in dissecting rooms, and for numerous similar purposes, I apprehend the chloric ether lamp will be found convenient, inexpensive and efficacious.

"I would remark that the proper material for combustion in the lamp is the 'strong chloric ether' used for inhalation, and not the chloric ether of

the Pharmacopœia. The latter does not furnish a sufficient quantity of the gas to be efficacious. If the former is not easily attainable, a tincture of chloroform, of the strength of one part of chloroform to six or eight of alcohol, will answer quite as well; in fact, the 'strong chloric ether' is nothing more than a tincture of chloroform.

"The lamps used for burning camphene are well adapted for this purpose, being provided with a small cap or extinguisher, which covers the wick and prevents evaporation of the ether when not in use. I have made, extemporaneously, a very excellent lamp by inserting two or three inches of glass tubing, of the diameter of a No. 16 bougie, through the cork of a wide-mouthed phial."

The proposal in the foregoing communication would offer a very neat mode for evolving chlorine for either inhalation or fumigation, if the gas produced was mainly chlorine. But the experiments which I have made in the burning of tincture of chloroform, have much disappointed the hopes with which, notwithstanding Dr. H.'s admission of the presence of muriatic acid, I first received the announcement. That chlorine is evolved, is unquestionable. But the proportion of this is so small, and that of chlorohydric acid so large, in the products of the combustion, that I greatly doubt whether it can be brought into useful competition, in any way, with the other methods of obtaining the disinfecting—certainly not the bleaching—effects for which chlorine is so well known. For some purposes of inhalation, it may possibly prove useful, conveying as it does the chlorine gas to the patient in a very dilute and not very disagreeable form; but this must of course be confined to cases in which the presence also of muriatic acid gas is not objectionable; unless, by the intervention of a vessel of water the latter could be absorbed, and the chlorine alone, with the requisite dilution by atmospheric air, applied to the lungs or other absorbing vessels of the patient, as required.

Dr. Hildreth speaks of the "strong chloric ether used for inhalation" being the proper kind to burn, "and not the chloric ether of the Pharmacopœia." What he has in view by the latter, I do not know, as there is no such thing in the United States Pharmacopœia, nor, so far as I am aware, in any of those of the British Colleges. But from several trials that I have made, I am inclined to think that the "strong chloric ether," made by dissolving one part of chloroform in two parts of alcohol, will not answer for burning, nearly so well as a tincture made by mixing two fluid

drachms of chloroform (equal to about $3\frac{1}{3}$ drachms by weight) with four fluid ounces of alcohol. The latter burns clear, with scarcely any smoke ; whereas the former produces so much smoke and soot as to be very offensive.

As chloroform contains about 90 per cent. of chlorine, one fluid ounce of the above proposed tincture (containing about $11\frac{1}{4}$ per cent. of chloroform) would have in its composition about 45 grains of chlorine, equal, if evolved in that form, to about 59 cubic inches of chlorine gas, or a little more than two pints. But until further examinations or experiments are pursued, we are in the dark as to the *chlorine value* of the resulting gas, as distinguished from the chlorohydric acid.

Philadelphia, 5th mo., 1852.

EXTRACTUM LOBELIÆ FLUIDUM.

By William Procter, Jr.

Having had occasion to prepare a fluid extract of lobelia at the solicitation of a druggist, the following process was employed, which is based on the fact, that in the presence of an excess of acid, the lobelina of the natural salt which gives activity to the drug is not decomposed and destroyed by the heat used, as explained on a former occasion, (vol. xiv. page 108 of this Journal.)

Take of Lobelia (the plant) finely bruised,	eight ounces, (troy)
Acetic acid	one fluid ounce.
Diluted alcohol	three pints.
Alcohol	six fluid ounces.

Macerate the lobelia in a pint and a half of the diluted alcohol, previously mixed with the acetic acid, for twenty-four hours ; introduce the mixture into an earthen displacer, pour on slowly the remainder of the diluted alcohol, and afterwards water until three pints of tincture are obtained; evaporate this in a water bath to ten fluid ounces, strain, add the alcohol and when mixed, filter through paper.

Each teaspoonful of this preparation is equal to half a fluid ounce of the tincture. It may be employed advantageously to

make a syrup of lobelia, by adding two fluid ounces of the fluid extract, to ten fluid ounces of simple syrup, and mixing. Syrup of lobelia is an eligible preparation for prescription use, in cases where lobelia is indicated as an expectorant.

ON FALSE MANNA.

By Robert P. Thomas, M. D.

An article has recently been introduced into this market and offered for sale under the name of manna, which differs so much both in its physical and chemical properties from what is generally understood as constituting a good manna, as also from the descriptions given in standard works of the various products floating about in European commerce bearing this name, that a short account of it, bringing the subject before the notice of the pharmaceutical profession may prove serviceable.

The article in question was brought here from New York; but whether it was of foreign origin, and had passed accidentally through the Custom House before or since the passage of the Inspection law, or whether it is of domestic manufacture, I am unable to ascertain. The probabilities are, however, that it has been imported.

It comes in large casks, packed in separate pieces weighing about half a pound. These pieces are of an oblong shape, from five to seven inches in length and from one and a half to three inches in breadth; and half as much in thickness; the angles being rounded off by pressure of the pieces upon each other. Each piece is carefully enveloped in long and broad leaves of some endogenous plant. When these are first removed, there is a strong odor exhaled, not unlike that of the drainings of old molasses casks. By exposure to the air the odor becomes more faint and saccharine. The taste is very sweet in those portions which are perfectly dry, whilst in darker and moister parts the sensation of sweetness is followed by a decided and permanently bitter taste. The dry surface is of a yellowish brown color, studded with numerous glistening points; in the damper portions

the shade of brown is much deeper, in some places being nearly black. The whole surface is rough and irregular. The fracture is equally rough and irregular, exhibiting many crystalline points, and here and there well defined crystals of cane sugar. The mass is made up of small compressed and flattened pieces that bear no inconsiderable resemblance to preserved citron. Both water and alcohol (sp. gr. ·835) dissolved about ninety per cent; water taking up a somewhat larger proportion than alcohol. The residuum is tasteless and odorless, and has a pectinous pulpy consistence after the action of water.

Prof. Wm. Procter, Jr., made some experiments with a view of determining its chemical nature, which, although not pushed so far as to decide on the character of the bitter principle, were sufficient to satisfy him, that the so-called manna does not contain any mannite, the saccharine constituent of all mannas, but that, on the contrary, its sweetness is owing to the presence of a large proportion of cane sugar with a little glucose.

A portion was boiled in alcohol (sp. gr. ·835,) strained while hot and set aside to cool and crystallize. At the expiration of 60 hours no crystals had formed. Had mannite been present, delicate crystalline needles would certainly have been deposited prior to the expiration of this period.

A second portion was dissolved in water, strained and concentrated to a syrupy consistence. Upon standing, well defined oblique, four-sided, transparent crystals were deposited in great abundance. These crystals were charred by sulphuric acid, but slightly affected by a boiling solution of caustic potassa, and when heated in an alkaline solution of sulphate of copper, afforded little if any evidence of grape sugar, whilst the brown mother liquor was blackened by boiling potassa solution and readily precipitated oxide of copper when the copper test was applied. No therapeutical experiments were made, inasmuch as the bitter after taste would preclude its use even as a substitute for fat manna, my object being simply to expose a gross adulteration.

OIL OF GAULTHERIA PROCUMBENS.

LANCASTER, May 20, 1852.

PROF. WM. PROCTER, JR., Philadelphia.

Dear Sir,—Your favor of the 18th came to hand, and I regret that I am not able at this time to give you more information about the use of Ess. Gaultheria in intermittent, than that it was very much used in the summers of '50 and '51, among the poorer class of people who live along the Conestoga, with much success; their manner of taking was a tea-spoonful before or at the time the first symptom appeared, and occasionally after the chill a dose; no particular regard to their diet or living.

The above was furnished to me by a middle aged man who had tried it himself, but without success; he, however, is much afflicted; quinine, barks and arsenic appear to have lost their effect upon him. He has chills every day.

Dr. Gerber purposes trying it upon some of his patients; his experience and observations I will give you shortly, though not in time for the next number of the Journal.

I make the Essence by dissolving ℥j. Ol. Gaultheria in Oij. of alcohol, and color with tincture of Saunders.

I must ask your indulgence, promising that if it does contain any virtues I shall advise you; as to its diuretic properties I am not able to say. Very truly,

CHARLES A. HEINITSH.

NOTE BY THE EDITOR.—We were induced to solicit further information on the above subject than was obtained in a casual conversation with Mr. H. some time back, more especially as the oil of winter-green thus far appears to have been used only as a perfume and flavoring agent. Another reason is, that recently, statements have occurred in the French Journals regarding the volatile oil of Spirea ulmaria or salicylous acid of chemists, a substance very analogous to the oil of Gaultheria procumbens in its sensible and chemical properties; the oil of spirea being a hyduret of salicyle, whilst the oil of gaultheria is the oxide of salicyle, or salicylic acid, united with the hydrated oxide of methyl. M. Hannon, in *Bull. gen. de Therap*, quoted in *Jour. de Pharm.*, for Jan., 1852, has given the results of some experiments with that oil in cases of hypertrophy of the heart, and in phthisis, wherein it manifested diuretic powers in a marked degree. M. Hannon has employed the oil of spirea in doses of 3 or 4 drops in the form of a tincture, and also has administered the compounds of the oil with potassa

and soda. Now as oil of gaultheria has the same specific gravity, odor and taste, and combines with the alkalies and as well as with chlorine, iodine and bromine as does the other oil, it is by no means improbable that it possesses therapeutic properties, perhaps analogous, or, if distinct, yet sufficiently interesting to attract and repay the attention of the physician. Should the information of Mr. Heinitsh, in relation to the alleged anti-periodic powers of oil of gaultheria be corroborated, it will prove as valuable in its medicinal, as it is extraordinary and interesting in its chemical relations.

SUPPOSITORIES.

By A. B. Taylor.

As our National Dispensatory gives no account of this valuable class of medicinal applications, (*suppositoria*) a brief notice of their preparation, in the "American Journal of Pharmacy," will perhaps be serviceable to some of its readers. Though hitherto but little employed in this country, suppositories have long been extensively used in France. They have recently, however, attracted the attention of some of our physicians, and bid fair to grow into much more general demand.

They may be described as medicated compounds of a stiff consistence, designed to be introduced into the rectum, and serving the purposes of the ordinary clysters or injections; (*Enemata.*) They are applicable in all cases of constipation, or of irritability, or inflammation of the lower intestines; and have the advantage over liquid injections, of more easy introduction, as well as of greater comfort and cleanliness; and they may sometimes be retained, when liquids would not. There is, perhaps, no substance so well adapted to serve as the vehicle of these applications, as the butter of cocoa, (*oleum cacao,*) as no combinations of suet, spermaceti, or wax, &c., combine in so great a degree the proper hardness or firmness of substance, with the requisite fusibility.

The following formula, is a prescription of Dr. S. W. Mitchell and has been considerably used.

Take of	Cocoa Butter	℥iss.
	Powdered Opium	gr.xii.

Mix and make into twelve suppositories.

The butter of cocoa is to be melted by a gentle heat. The opium is then to be well rubbed up with a small quantity of the fluid, until thoroughly incorporated, and the remainder of the melted butter gradually added. When cool and slightly thickened, the mass, being well stirred, should then be poured into paper cones.* If the cocoa butter is too fluid when transferred to the moulds, the opium will settle to the apex of the cone, and not be properly diffused through the substance. When perfectly hard, these cones should then be pared or scraped at the base, until they weigh just one drachm,—giving one grain of opium to each suppository. Practically, therefore, it will be necessary to make one less than the required number,—reserving the parings for another operation.

The following formula has been prescribed by Dr. Pancoast:

Take of	Cocoa Butter	℥i.
	Extract of Krameria	℈ii.
	Powdered Opium	gr.v.

Mix and make into ten suppositories, as above.

It is stated that cocoa butter is much esteemed in France, for its supposed healing qualities, and is a favorite application in cases of piles. With powdered galls, or tannic acid, this substance would therefore probably form a useful substitute for the ordinary pile ointment. The proportions to be employed, would of course be regulated entirely by the physician's order.

In Dorvault's French work on "Practical Pharmacy," suppositories are described as varying from the size of the little finger, to that of the thumb; and weighing, from ʒi¼ to ʒii½; (five to ten *grammes.*) The author gives as a formula for the vehicle, butter of cocoa melted with an eighth part, by weight, of white wax: or as an inferior substitute, and one less used, common tallow mixed with the same proportion of wax. Soap suppositories are formed by simply cutting soap into convenient shapes. Suppositories are also prepared from honey, by boiling down this substance till it becomes sufficiently hard to retain its shape. There are also formulæ given for anthelmintic, anti-hemorrhoidal, astringent, emmenagogue, laxative, and vaginal suppositories;

* These moulds should be made of sized or writing paper, and may be conveniently placed in shallow boxes of sand, to preserve their position.

as well as belladonna, calomel, cicuta, mercurial, and quinine suppositories.

In GRAY's "Supplement to the Pharmacopœia," there is given the following formula for a suppository; taken from the *Codex Medic. Hamberg*, 1845.

℞.	Aloes	ʒvi.
	Common Salt	℥iss.
	Spanish Soap	℥iss.
	Starch	℥viii.

Mix and make into a mass with honey, and then form into cones of the required size.

ON HOFFMAN'S ANODYNE LIQUOR.

By WILLIAM PROCTER, JR.

Perhaps in no preparation in general use does the practice of manufacturers, and the requirements of pharmacopœial authorities, more widely differ than in the Compound Spirit of Ether, universally known as Hoffman's Anodyne Liquor. According to the United States and London Pharmacopœias it consists of three fluid drachms of heavy oil of wine (Oleum Ethereum, U. S. P.) dissolved in a mixture of eight fluid ounces of ether and sixteen fluid ounces of alcohol. The Edinburgh Pharmacopœia has only the simple spirit of ether without the oil of wine, whilst the Dublin Pharmacopœia of 1850, under the name of Spiritus Æthereus Oleosus, gives the following formula, which includes the preparation of the oil of wine and its subsequent solution to make the anodyne: Mix a pint of alcohol and a pint and a half of oil of vitriol in a glass matrass, adapt a Liebig's condenser, and by heat distill until a black froth rises. Separate the lighter ethereal liquid in the receiver, expose it for 24 hours in a capsule, wash the residual oil with water, and dissolve it in a mixture of five fluid ounces of ether and ten fluid ounces of alcohol. In France, Hoffman's anodyne consists of equal parts of ether and alcohol without oil of wine.

Owing to the careless or intentionally mystified manner of ex-

pressing himself, it is impossible now to ascertain whether the original preparation of Hoffman (published in 1732) was constant in its strength, as now recommended by the Pharmacopœia. Beaumè, (as quoted in Macquer's Chem. Dict., London, 1771,) says, in speaking of the rectification of sulphuric ether, "By distilling the liquor in the first receiver, together with a very small quantity of oil of tartar, by a very gentle heat of a lamp furnace, about two pounds and four ounces of pure ether may be obtained; and afterwards when a new receiver is adapted, and a stronger heat applied, from eight to ten ounces of aromatic liquor, which makes a good *anodyne mineral liquor of Hoffman*, will be distilled."

The third edition of Lewis' Dispensatory, published at Dublin, 1768, has the following formula for this preparation which appears to be what the apothecaries of that day employed:

"*Hoffman's Mineral Anodyne Liquor.*"

Into half a pound of concentrated oil of vitriol, placed in a large glass retort, pour by little and little, through a long stemmed funnel, one pint and a half of highly rectified spirit of wine. Stop the mouth of the retort, digest for some days, and then distil with a very gentle heat. At first a fragrant spirit of wine will arise; and after it a more fragrant volatile spirit, to be caught in a fresh receiver. The receiver being again changed, a sulphurous, volatile, acid phlegm comes over, and at length a *sweet oil of vitriol*, which should be immediately separated, lest it be absorbed by the phlegm. Mix the first and second spirits together, and in [every] two ounces of this mixture dissolve twelve drops of the sweet oil. If the liquor has any sulphurous smell, re-distill it from a little salt of tartar.

"Whether this is the exact preparation, so much recommended and so often prescribed by Hoffman as an anodyne and anti-spasmodic, we cannot determine. We learn from his own writings that his anodyne liquor was composed of the dulcified spirit of vitriol, [crude ether] and the aromatic oil which rises after it; but not in what proportions he mixed them together. The College of Wirtemburg seems to think that all the oil was mixed with all the spirit obtained in one operation without regard to the precise quantities."

The product of this recipe must have been analogous to the present officinal spirit, the formula for which is evidently modeled after it. The great excess of alcohol distills over first, until the boiling point rises to the ether producing temperature, when ether is obtained, and finally the sulphurous oily product. The re-

cipe gives no direction to isolate the oil of wine before measuring it, which is perhaps less necessary, as the ethereal part of the distillate is removed previously to the production of the oil which is found in the receiver in globules, and not in solution.

The process now adopted by the manufacturers in this city avoids the isolation of the oil of wine, and from the nature of the conditions the product is liable to vary in the proportions of its ingredients, not only in different laboratories, but at different operations in the same laboratory. In the preparation of ether it is usual in this city to push the process as far as possible, as long as the residue is not so concentrated as to eliminate much permanent gas. In the rectification of this first crude product, the distillate is reserved as rectified ether as long as its specific gravity marks 54° Baumé, or there about. By continuing the process the product is found to consist of ether, alcohol and water, impregnated with oil of wine. Every one who has made ether knows how very liable the product is to vary with an ill regulated heat; on the one hand unaltered alcohol will pass over if the temperature is too low, whilst too great a heat, especially towards the last of the process, will favor the formation of oil of wine and sulphurous acid. This last distillate, therefore, will vary in composition, and it is from this that Hoffman's anodyne is made in some of the best of our laboratories. *There is no known practicable method of ascertaining the per centage of heavy oil of wine in this liquid.* The means used by the manufacturer are founded on the sensible properties of an arbitrary standard specimen of Hoffman's anodyne previously made, and on the degree of opalescence or milkiness it produces when added to a certain measure of water. This milkiness is occasioned by the oil of wine present; but experience has shown that the degree of milkiness is not strictly in proportion to the quantity of oil present, the relative proportion of ether and alcohol, and perhaps water present in the anodyne liquid has a marked influence on the phenomenon; if too much alcohol, the milkiness is not produced, or but partially; if too much ether, oily globules separate and float with but moderate opalescence. In converting his second ethereal distillate into commercial Hoffman's anodyne, the operator has to make several essays, sometimes adding water, sometimes alcohol or ether, until the taste, the smell, and the opalescence agree,

as nearly as can be approached with his standard specimen. In the process of rectification it is probable that at least a part of the heavy oil of wine is decomposed, with the production of the light oil or etherole, and that the commercial Hoffman's anodyne differs in this respect, as well as in containing a much smaller proportion of oil of wine, from that of the Pharmacopœia.

To get a better idea of the preparation in use here, authentic specimens were obtained from four of our largest manufacturing chemists, and compared with compound spirit of ether made for the occasion strictly according to the United States Pharmacopœia. Their density was carefully taken with the 1000 grs. bottle.

A, Wetherill & Brothers	specific	gravity at	60° F.	.8925
B, Smith, Pemberton & Co.	"	"	"	.8723
C, Rosengarten & Dennis	"	"	"	.8495
D, Powers & Weightman	"	"	"	.8394
E, U. S. Pharmacopœia	"	"	"	.8151

Equal measures of each specimen and distilled water were mixed together; they all produced opaque milky liquids; globules of oil of wine soon separated from the mixture with E and floated on the surface, while the liquid gradually lost its opacity as more of the oil arose. The mixture with D became less opaque by standing, a small portion of oil rising to the surface. The mixtures with A B and C retained their opacity without apparent separation of oil of wine, A being the most so.

A was the mildest and least repulsive to the taste, because least ethereal. C was the next least ethereal, but had pungency not arising from ether. B was more ethereal than the preceding, notwithstanding its greater specific gravity. D was yet more charged with ether. E presented sensible properties differing from all the others, being more ethereal and aromatic, but without a peculiar taste noticeable in the other specimens, more especially in C.

When $2\frac{1}{2}$ fluid drachms of each specimen was shaken in graduated tubes with 60 grains of carbonate of potassa, they were dehydrated somewhat in the ratio of their specific gravities. A and B dissolved the salt readily by a few minutes' agitation, and the separated aqueons alkaline solution equalled a third of the bulk of the mixture. In C and D only about half of the salt was dissolved, whilst in E the salt was merely rendered pasty.

To get an idea of the proportion of ether present in these specimens, a solution of dry chloride of calcium in an equal weight of water, was made. Five parts of this solution was mixed with three parts of each of specimens of Hoffman's anodyne, in tall tubular vials, corked, well agitated and allowed to stand for twelve hours. In A, B, and C, no separation of ether occurred, but in each of them a few globules arose to the surface, consisting chiefly of light oil of wine. In D, a stratum of ether holding oil of wine in solution, equal to one seventh of the bulk of the spirit used, or nearly half a part. Whilst in E, the super-stratum of ether equalled one third of the spirit used, and had a light yellow color, due to the oil of wine.

These data will give an approximative idea of their compositions; it would appear that A was chiefly alcohol and water with but little ether; that B contained almost as much water as A but less alcohol and more ether; that C contained much less water than A or B, but less ether and more alcohol than B, and more ether and less alcohol than A; that D contained rather more water than C, but more ether and less alcohol than either of the preceding; and lastly that E contains more ether, and less alcohol and water than either of the others.

In regard to the proportion of ethereal oil, the experiments give no positive clue. It would appear that B and D contained the most among the commercial specimens, and that D approaches nearest the composition of the officinal spirit, yet all of them when compared with the officinal are deficient in this ingredient.

It must be apparent from these results, that the opacity of a mixture of Hoffman's anodyne and water, is no index of the proportion of oil of wine the former contains, that property being dependant apparently on the state of combination in which the oil exists, nor would we pronounce on the medicinal value of the specimens, a task belonging to the physician. Whatever curative reputation the compound spirit of ether may have earned, certainly belongs to the commercial spirit, and not to that of the Pharmacopœia, which is not to be had in the shops.

The exact nature of the liquid left after the rectification of ether is an inquiry well worthy of further investigation. The alcohol of commerce is not a homogenous substance. Besides water it contains odoriferous oily matter, produced in the original fermentation,

and which is not wholly removed in the rectification of whiskey. This matter, modified by the action of sulphuric acid and heat, with the volatile substances generated during the ether process, are contained in it. It may also be that the ether in this residue is more intimately combined with water than in a mere mixture of water, alcohol, and ether of the same strength, as suggested to me by Mr. Pemberton.

The question very naturally arises, why do not the manufacturers prepare the officinal Hoffman's anodyne, or why do they not furnish the ethereal oil of the Pharmacopœia, that the apothecary may make it himself by simple mixing? There are several reasons. 1st, the apothecary, the physician, and to a large extent the consumer, have become accustomed to the present commercial preparation, and the majority, both of apothecaries and physicians, would reject the true officinal spirit, if presented to them, as not correctly made; 2d, druggists, as a general rule, would refuse to pay the greatly increased price, absolutely required to remunerate the manufacturer, for the greater consumption of time and materials, and increased skill and risk in manipulation. Having on several occasions prepared the officinal oil of wine and Hoffman's anodyne, I can corroborate the statements of Mr. Kent, at p. 255, relative to the small yield, and consequent costliness of officinal heavy oil of wine. The so-called oil of wine, which is imported into this city from England, and which is sometimes employed for making the officinal spirit, is an ethereal solution of etherole, one specimen yielding only seven per cent. of it. And 3d, in the preparation of ether, the residue left in the still after the rectification of the ether above 54° Beaumé, must either be thrown away, or converted to the only use to which it can be applied with advantage, viz., Hoffman's anodyne. It is for this reason that the price of the commercial "anodyne" is so low, being about fifteen cents per pound.

It may become a question in the next revision of the Pharmacopœia, whether it would not be better to reconstruct the formula for compound spirit of ether, somewhat on the plan of the manufacturers, or that quoted at page 213, from Lewis's Dispensatory, so as to render it more practicable and likely to be followed. Of course it should be done with due consideration of the difficulties involved in the production of a spirit of uniform strength.

PHARMACEUTICAL NOTICES.

Being extracts from various articles in the New York Journal of Pharmacy, with comments, by the Editor.

Stramonium ointment, by Eugene Dupuy. The author notices the new formula (Pharm. 1850,) for this preparation, and considers it objectionable on the ground of its not possessing the green color of the old ointment by infusion. He proposes to remedy this difficulty by the following process, viz:

"Take of	Stramonium leaves	half a pound
	Alcohol 95°	a sufficient quantity
	Prepared Lard	fourteen ounces.

Moisten the leaves previously reduced to coarse powder, with sufficient alcohol, in a tight vessel having a suitable cover; melt the lard in a pan three times in capacity to the bulk of the lard, and stir in gradually the prepared Stramonium; keep the mixture in a warm place for five hours, stirring occasionally, till the alcohol has disappeared from the ointment, which may be ascertained by applying a lighted match to the surface of the warm ointment after stirring and then filter hot. Thus prepared the ointment has a handsome green color, and according to Mr. D. is a reliable preparation.

The objection to the officinal formula on the score of color is hardly valid, and if it was so, it would be better to color it when desirable with *alcoholic extract of grass*, than to substitute a preparation which will constantly vary in strength and appearance with the age of the leaves. The officinal extract of stramonium is easily incorporated with lard, and produces a brown colored ointment, of comparatively uniform strength.

On Blistering Cerate, by Eugene Dupuy. "I have been for many years in the habit of preparing a plaster which, I think, has some advantages over our officinal cerate, because it fixes the volatilizable principle, and at the same time rather increases than diminishes its energy.

"To the officinal plastic mixture in which the powdered cantharides have been gradually incorporated, I add about five per cent of a mixture containing equal parts of strong acetic acid, (prepared by the distillation of the acetate of copper or lead) and pulverized camphor. The acetic acid transforms the can-

tharidin into an acetate of the same which is not volatilized at ordinary temperatures, and the camphor diminishes the symptoms of stranguary which some patients have to endure when the application of blistering plaster is resorted to."

We do not undertand in what way acetic acid, itself a very volatile substance, should be able to *fix* cantharidin, which our author himself properly calls a *neutral* substance, so as to form an *acetate*. According to Mr. Redwood, (Pharm. Jour. Oct, 1841,) acetic acid is not a good solvent for cantharidin and the Acetum Cantharidis (Lond. Ph.) owes it rubefacient action to the acid chiefly. In reference to the volatility of cantharidin, the following experiment shows that this principle is not so volatile as some authors state it to be. 100 grains of powdered cantharides was introduced into the bottom of a test tube by means of a tube funnel so as not to soil the sides. A large tube with the upper end drawn out to a small orifice was placed over the mouth of the test tube, whilst the closed end containing the flies projected through a tin cover into a vessel of water which was kept boiling for six hours. At first the hygrometric water of the flies was condensed above and removed, and at the end of the experiment a minute deposit of microscopic crystals was observed, not exceeding the thirtieth of a grain. This experiment is part of an investigation of the subject of cantharides not yet ready for publication.

On Mucilage of Gum Arabic, by George D. Coggeshall. The author considers the officinal formula for Mucilage of Gum Arabic as nearly useless, in as much as it is rarely followed in the practice of extemporaneous pharmacy. He thinks that one ounce to seven ounces of water comes near the average practice of apothecaries, and intention of physicians, and that the solution is better when made from the unpowdered gum with cold water, as in the process for syrup of gum. He further remarks, "Upon the whole it seems desirable that there should be a uniform strength for the mucilage of gum arabic, prescribed by physicians in mixtures, which the officinal preparation evidently is not. Our mucilage does not enter into other officinal preparations, and if it did, the combination of gum and water had better be made in general process, as in our almond mixture."

We object to Mr. Coggeshall's idea of reducing the strength

of this preparation, or to removing it. The term "Mucilage" most properly applies to a solution of gum of the officinal strength, which is that most appropriate for emulsions, for which use it is chiefly designed. Unfortunately, physicians are not sufficiently impressed with the meaning of the officinal term, and use it when they desire a demulcent solution for cough mixtures, which as a general rule is very properly made of the strength (1 to 7 of water) suggested by Mr. Coggeshall, and which we would gladly see made officinal under the name "Liquor Acaciæ," or some other.

Compound Spirit of Lavander. Mr. Coggeshall objects to the officinal formula for this preparation on the score of using the simple distilled spirit of lavander in its preparation, which is difficult to procure, weak, and rarely used. He also objects to the employment of a solution of the oil of lavender as a substitute, owing to its general inferior quality, and to its separating on mixing the spirit with water. As a substitute for the officinal formula he proposes the following recipe, which he has employed for several years with entire satisfaction, viz:

"Take of Lavander flowers, twelve ounces (Troy.)
" Rosemary leaves, bruised.
" Cinnamon bruised, each four ounces and a half.
" Nutmegs, bruised.
" Cloves, bruised each six drachms.
" Coriander seed, bruised.
" Red Saunders, rasped, each three ounces.
" Powered Turmeric, one drachm.
" Alcohol, six pints.
" Water, five pints and a quarter.
Mix, digest for fourteen days, express and filter."

We agree with the author in his opinion of this formula, and we hope at the proper time either this or one similar in its character will be introduced into our national codex.

Syrup of Gum Arabic. Mr. Coggeshall finds fault with the formula for syrup of gum in the present Pharmacopœia, and prefers that of 1830; and he wonders at its removal in 1840. Its proverbial tendency to decomposition, as made in 1830, caused its removal, instead of its revision, as should have been done.

We regret that Mr. C. is not satisfied with the present formula, which we thought has given almost universal satisfaction.

Syrup of Citric Acid. Mr. Coggeshall recommends two drachms of the tincture of recent lemon peel to be used instead of four minums of oil of lemon in the preparation of this syrup.

Syrup of Ipecacuanha. The formula for this preparation has received a fearful blow from the critical pen of Mr. Coggeshall. He considers it faulty in language, in manipulation and in strength, and little "calculated to answer medical wants in regard to its importance." Mr. Coggeshall speaks of New York, where he says it is not probable that the present officinal syrup of ipecacuanha can ever supercede the efficient and reliable one we have so long been accustomed to, nor answer the wishes and expectations of the medical profession. I append the formula proposed in a paper read before the Board of Trustees in 1835, seven years before this syrup appeared in our Pharmacopœia. I have not found cause to change it in any respect. It affords about three pints of syrup, which keeps well for years at the ordinary temperatures of the shop, and dwellings; the proportion of sugar proves to be just what is wanted for a proper consistence without crystallization, and, as a medicine it gives entire satisfaction to the prescriber. It is as follows:

Take of Ipecacuanha, bruised, six ounces (troy.)
Alcohol, one pint and a half.
Water, one pint.

Mix to form a tincture. Digest for ten days, filter and add one pint of water by way of displacement, evaporate in a water bath to two pints, add immediately,

Refined sugar three pounds and a quarter (troy)

and bring to the boiling point."

This preparation when finished will therefore be *four* times the strength of that of the Pharmacopœia, and decidedly *alcoholic* which is the reason it keeps well. Such a syrup would undoubtedly be more efficient in croup or other disease requiring the rapid emetic action of ipecacuanha; but we may doubt the advantage of substituting it for the officinal syrup in a very large number of cases where the diaphoretic and expectorant, action is needed.

The syrup of the French Codex, (1837) and of the Edinburgh

Pharmacopœia, 1839, is about equal in strength to that of the United States Pharmacopœia, and we do not see why the revisors of the latter work can be censured for not adopting a formula the particulars of which they were perhaps not aware of, and the increased strength of which they did not approve.

Compound Syrup of Squill. Mr. Coggeshall objects very properly to the first process of the U. S. Pharm. for this syrup, as yielding an inelegant preparation. He objects to the second process also on the ground that the diluted alcohol is not as strong, or in as large quantity as it should be. In view of these *presumed* defects the following formula is offered.

"Take of Seneka bruised, Squill bruised, each four ounces.
Alcohol, Water, each two pints.
Mix to form a tincture. Digest ten days, filter, and add twelve ounces of water, by way of displacement, evaporate by water bath to two pints, add
Sugar, fifteen ounces. Honey eighteen ounces,
Boil to three pints and a half, in which dissolve while hot,
Tartar emetic fifty-six grains."

In commenting on these remarks we would suggest that cold water alone is quite adequate for the extraction of seneka and squill, but both in squill and seneka there exists mucilaginous and gummy matters which interfere with the process of percolation when water is used. The addition of one sixth of alcohol in the United States process is to facilitate the passage of the solvent, and to cause it to reject a part of the mucilage. There is no objection to having it more alcoholic, perhaps an advantage. In reference to the quantity of menstruum, it is sufficient, provided the officinal directions for conducting the displacement process are carefully followed. The formula offered by Mr. Coggeshall presents an anomaly in syrups—so far as consistence is concerned. But 15 ounces of sugar and 18 ounces of honey (about 13 fluid ounces) in 56 fluid ounces of syrup! This is almost as far out of the way as the old process of 1830. Besides it is impossible to follow the directions *to boil to three pints and a half,* because 18 ounces of honey and 15 (troy) ounces of sugar when dissolved in two pints of the evaporated tincture, *will not measure* 56 fluid ounces before the ebullition commences, certainly not after it. Further; such a syrup will not keep, *unless* so much alcohol is retained in the

preparation as will interfere with its value. It is well to recollect that in the evaporation of diluted alcohol, the water as well as the alcohol passes off, and that the evaporation of 4 pints of a tincture to 2 pints does not remove all the alcohol.

Tincture of Aconite root. Mr. Coggeshall, in common with some others, believes that Fleming's Tincture (16 ounces of root to Oiss. of alcohol) is to be preferred. As three different revising committees in as many countries, with that formula in view, have, however, adopted the proportion of six ounces to 16 fluid ounces, we cannot see why objection should be urged. If in special cases a stronger tincture is needed, make it, but when the officinal formula is adequate in nineteen cases out of twenty, let us not meddle with it. Besides, we are apt to speak of saturated tinctures without being aware of the limit to the solvent power of menstrua. The observations of M. Personne (American Jour. Pharm. vol. xviii, pages 21 and 108,) are well worth perusal; and *a priori* we do not believe that the most skilful manipulator in New York or Philadelphia can extract the whole of the activity of 16 oz. aconite root with $1\frac{1}{2}$ pints of alcohol, allowing him sufficient of the menstruum in addition to displace out a pint and a half of tincture.

Compound Tincture of Cardamom is objected to by Mr. Coggeshall because it is stronger of cardamom than the London formula, previously in use. If this tincture is merely used as a *coloring* agent in prescriptions to please the fancy, the objection holds good, but as it was introduced chiefly for its carminative qualities, the increased force communicated by the cardamom is advantageous.

Pilulæ Ferri Compositæ. By Benjamin Canavan. The author considers the officinal directions insufficient to develope the chemical changes evidently desired in the construction of the formula, viz. the formation of proto-carbonate of iron. He suggests that " the *only* way by which the pill ought or can be prepared, is by triturating separately and to solution the two salts in the necessary quantity of syrup, mixing, and again triturating until perfect decomposition is induced, and by incorporating the myrrh, form into a mass without delay." This suggestion is a decided improvement on the officinal direction. In our own experience we have arrived at a simular result, by reducing the two salts and the myrrh, in tears, separately to powder, then triturating the sulphate

of iron with about half a drachm of syrup, until reduced to a smooth paste, afterwards adding the carbonate of soda, rubbing until the decomposition is finished, and lastly adding the myrrh and incorporating it. The use of the unpowdered myrrh will be found to give a peculiar consistence to the mass, arising from the intimate admixture of the oleo-resinous particles with the salts.

Mistura Amygdalæ. Mr. Canavan proposes, instead of keeping the solid ingredients of this mixture ready mixed as recommended by the Pharmacopœia, that the almonds be preserved for use after being *blanched and well dried*, in which state they are not liable to change as when the kernel is beaten into a paste with sugar and gum.

Liquor Potassæ Arsenitis. In a note on this subject Mr. Canavan states that a shop bottle of Fowler's solution, which had been kept some six or twelve years, exhaled a strong garlicky odor characteristic of free metallic arsenic. The interior surface of the bottle was found to be corroded, and possessed a metallic lustre which Mr. Canavan considered to be metallic lead, eliminated from the flint glass by the action of the solution; as it was slowly acted upon by acetic acid it yielded iodide of lead with iodide of potassium. This is a curious fact, probably due to the excess of alkali in the arsenite. We do not understand where the garlicky odor came from, as it is only the *vapor* of metallic arsenic that possesses this peculiarity.

ON THE NITRATE OF SODA DEPOSITS OF SOUTHERN PERU.

In the twenty-first volume of the Journal of the Royal Geographical Society, is a descripton of the province of Tarapaca, in Southern Peru, from which the following account of the deposits of *nitrate of soda* is taken.

"The existence of this valuable substance in the province of Tarapaca, has been known in Europe about a century. In 1820, some of it was sent to England, but the duty then being so high, it was thrown overboard. In 1827, efforts were unsuccessfully made by an English house to import it. In 1830, a cargo was sent to the United States; it was found unsaleable there, and a

part of it taken to Liverpool, but was returned as unsaleable in England. A cargo was then sent to France, and in 1831 another to England, where it became better known, and sold as high as 30*s*. to 40*s*. the cwt. Its price has varied very much; present quotations (1851) about 15*s*. Since 1830 to 1850, the exports of nitrate from Iquique, have been 5,293,478 quintals, equal to 239,860 tons; some of it being used as a fertilizer of land, some in the manufacture of nitric acid.

The principal deposits of nitrate of soda yet known, are found on the western side of the Pampa de Tamarugal, commencing immediately where the level plain ceases, and on the sides of some of the ravines running from the Pampa towards the coast, and in some of the hollows of the mountains. The nitrate has not been found nearer to the coast than eighteen miles, and looks as if it gradually transferred itself into salt as it approached the coast. The officinas, or refining works are divided into northern and southern salitres; the old salitres being about the centre of the former, and La Nueva Norvia that of the latter; there are in all about one hundred.

The nitrate deposits commence about Tiliviche, and extend S. near to Quilliagua, with interruptions of deposits of common salt. The nitrate caliche grounds vary in breadth; the average may be five hundred yards, and in places seven or eight feet thick, and sometimes quite pure. In the ravines and hollows, before mentioned, the nitrate is found on the shelving sides; the hollows look like dried up lakes, and are covered with salt two or three feet thick, and on the margin there is nitrate of soda, ofttimes going down to some depth; in others there is a hard crust upon it, occasionally four feet thick. The nitrate caliche found under this crust is in thin layers, and so solid and pure as to be sought for, although the expense of blasting is very great.

There are several varieties of the nitrate of soda caliche; the following being the principal:

1. White compact, containing sixty-four per cent.
2. Yellow, occasioned by salts of iodine, seventy per cent.
3. Grey compact, containing a little iron and a trace of iodine, forty-six per cent.
4. Grey crystalline, the most abundant variety, contains from twenty to eighty-five per cent., affording traces of iodine, with one to eight per cent. of earthy matters.

5. White crystalline; this resembles the refined nitrate. All these contain common salt, sulphate and carbonate of soda, muriate of lime, and occasionally some borate of lime is found under the nitrate beds; one variety of the latter, composed of boracic acid, 49.5; soda, 8.8; water, 26.0; lime, 15.7=100, may probably become of use in this country in glass making, &c.

The rough nitrate of soda is broken into several small pieces, put into boilers, water introduced, and the whole boiled; the nitrate is held in solution, whilst earthy matter, salt, sulphates, &c., are separated and fall to the bottom of the vessel; the saturated solution of nitrate is led into a reservoir, where it deposits any remaining earthy matter; the clear liquor is run into shallow troughs, exposed to the sun; the nitrate of soda crystallizes, containing only two to three per cent. of impurities, and is ready to be conveyed to the coast for exportation.

The Pampa de Tamarugal, contains sufficient nitrate for the consumption of Europe for ages; the desert of Atacama, yields it; it has also been met with in the Andes, and in the eastern plains.

ON HELLEBORUS NIGER.

By G. Walpers.

M. Walpers gives a minute description of the rhizome of Helleborus niger, for the purpose of distinguishing it from similar roots with which it is liable to be confounded. The plants, whose roots seem to be most easily mistaken for the officinal, are Helleborus viridis, Adonis vernalis, Actæa spicata, Astrantia major, and Helleborus fœtidus. They may be distinguished by the following characteristics.

Helleborus niger.—The dried rhizome is odorless, dark chestnut brown, from the thickness of a swan-quill to that of the little finger, drawn up, branching, many-headed, rendered somewhat knotty by the cicatrices of the leaf-stalks, the elevated margins of which form dish-like excavations, beset with radicles from one to two lines in diameter, six to twelve inches in length, and, in general, but little branched; these break with a horny fracture,

showing a clean white internal structure, and in the middle a small, more transparent medulla, which, under a magnifier is usually sharply 4–5 cornered. The taste is at first slightly sweetish, then sharp and radish-like. In old specimens this sharp after-taste is frequently wanting.

Helleborus viridis.—Of all those mentioned, the rhizome of this plant has the greatest resemblance to that of Helleborus niger. It is branching, many-headed, drawn up, marked with dish-like cicatrices of the leaf-stalks, beset with long, solitary radicles, $\frac{1}{2}$—$\frac{3}{4}$ of a line in diameter, the color generally grayish-black, but towards the origins of the leaf-stalks, grayish-green, even in the dry condition. The radicles break with a horny fracture, are grayish-green internally, marked in the middle with a white, sharply four-cornered, cross-shaped medulla. The taste is radish-like and disgustingly acrid.

Adonis vernalis.—The rhizome has also some similarity to that of Helleborus niger; it may be recognized, however, by its radish-like odor. It is also cognoscible by the presence of a number of dry, membranous, brownish-colored, and scale-like leaves, by the want of the circular scars of the leaf-stalks, as well as by the longitudinally wrinkled, fragile, and strongly odorous radicles, which, upon fracture appear grayish green, and have a white, sharply 4—5 cornered medulla.

The rhizomes of the remaining plants have a less close resemblance to the officinal.

Actæa spicata.—The rhizome is thick, fleshy, many-headed, marked toward the apex with ill defined cicatrices of the leaf-stalks, which, although circular, never form dish-like excavations. It is beset with long, yellowish-brown, much ramified, and at last thread-like radicles; a smooth fracture of the stronger of these, shows a distinct cortical portion, and an obtusely 3—5 rayed medulla. The taste is slightly bitter, but not radish-like.

Astrantia major.—This has a thick, fleshy, many-headed, blackish-brown rhizome, of a somewhat resinous odor in the fresh state, without smell when dried, beset with much ramified, and at last thread-like radicles, the thicker of which are from $\frac{1}{4}$—$\frac{1}{2}$ a line in diameter, and have a brownish-yellow cortical portion, and a white rounded medulla. Toward the apex of the rhizome are found ring-form scars of the leaf-stalks, or the yet remaining leaf-stalks themselves. The taste is feebly bitter.

Helleborus fœtidus.—It is not easy to mistake the root of this plant for that of Helleborus niger. It is thick, woody, much-branched, and of a chestnut-brown color. Upon examination of an oblique section of the fresh root, of the thickness of the finger, a light-green pith cylinder may be observed, blending, as it were, with the cortical portion; if the root be dried, this entirely disappears. The radicles have a ligneous fracture, and internally, a yellowish color.

With the aid of the microscope the difference between these roots may also be demonstrated. It is necessary, however, in connection with other observations, to study sections of the radicles; for this purpose the smaller are to be preferred. M. Walpers thus describes the microscopic structure:

An oblique section of the radicles of Helleborus niger, shows a thick cortical portion, surrounded by a stratum of semi-cylindric, rather thick-walled epidermis cells, dark brown only on their external wall. The cortical layer consists of large, tolerably compact, 5—6 sided parenchyma cells, which are closely filled with minute, spherical, conglomerate fecula granules. The medullary body is irregular, sharply 4—5 cornered, and consists of very thick-walled, reticulately punctate vessels. Between the projecting rays of the medulla is a collection of thin-walled elongate cells, filled with fecula granules and oil globules. In several places the bundle of vessels of the medullary portion is invaded by pith-cells similar in form to those of the cortex, and like them filled with fecula.

Helleborus viridis differs, inasmuch as the cortical layer of its radicles contains but few fecula granules, and many oil globules. The central portion is compact; the vessels are reticulated in the same manner, but are never invaded by pith-cells; there are, indeed, but few pith-cells visible.

Very much the same structure may be remarked in the radicles of Adonis vernalis; the epidermis-cells, however, are not only brown on their external, but also on their internal walls. The cells of the cortical and medullary layers contain minute spherical, but not conglomerate fecula granules, together with numerous oil-globules. The central portion, consisting of dotted vessels, is sharply 4—5 cornered, either compact, like that of Helleborus viridis, or divided by 4—5 rayed pithy bodies into as many star-formed and separate fascicles of vessels.

The radicles of Actæa spicata may be distinguished at a glance, not only by the want of any intercellular arrangement between the thickly filled cells of the parenchyma of the cortex, but also by a peculiarity of the cell-walls themselves, which resemble, in this respect, those of many of the Orchideæ; each cell being provided with minute, obliquely directed, interlacing fibres; these, if the fecula be removed by means of a small hair pencil, are easily recognized. The central body, consisting of bundles of vessels arranged in a wide net work, accompanied on the external side by thin-walled parenchyma cells, is marked with from 3—5 deep, and obtusely wedge-shaped rays. Upon a smooth oblique section this form of medulla may be observed with the unassisted eye.

The radicles of Astrantia major have a dark brown epidermis, surrounded by obtusely conical, occasionally elongate glandules, consisting of a single cell. The parenchyma cells of the cortex are filled with rather large, rounded fecula granules, which are covered with a resinous matter; from this originates the brownish color of the cortical layer, which may easily be perceived in a recent fracture. The obtusely five-cornered medullary portion encloses a pith similar to the parenchyma of the cortical layer, and a net work of vessels, accompanied by thin-walled elongate cells.

Finally, an oblique section of the radicles of Helleborus fœtidus shows a broad cortical stratum of regularly disposed parenchyma, which, in the root taken up in June, contains no fecula, and but little intercellular matter; it is distinctly separated from the central portion by darker colored, somewhat contracted cells. The rounded, obtusely cornered medullary body contains no pith in the radicles, but is made up of thick walled wood-cells, and vessels of a stellate appearance, the peculiar form of which has already been described and figured by M. Schleiden. The inner wall of these vessels is covered by two differently formed layers; the exterior consisting of a very close net-work, while the interior, on the contrary, is furnished with 2—3 rows of very wide pores. As the external vessels are not unfrequently merely marked by the net-work, it would appear, as in the wood of the linden, that the porous layer is the younger. —*Central Blatt, of Feb.* 4, 1852, *from Archiv. der Pharm.*

ON SOCOTRINE ALOE JUICE, OR LIQUID SOCOTRINE ALOES.

By Jonathan Pereira, M. D., F. R. S., Physician to the London Hospital.

It has long been known that the Socotrine aloes imported into England varies considerably in its consistency, and is sometimes met with in a soft or semi-fluid state. Frequently, on opening a package of this sort of aloes the interior is found to be quite soft, while the exterior is firm and hard. In general this arises from insufficient evaporation of the aloe juice.

In the third edition of my *Elements of Materia Medica* (vol. ii., part 1, p. 1077, published in 1850, I have briefly referred to a soft or semi-liquid Socotrine aloes, which had a bright or palm-oil yellow color and odor. At that time I had but little opportunity of investigating this very interesting drug; but a large importation of it having recently taken place, I have more fully examined it, and as it appears to me to be the raw or unboiled juice of the plant yielding what is known in commerce as Socotrine aloes I propose to distinguish it from the ordinary soft socotrine aloes by the name of "*Socotrine Aloe Juice.*"

Messrs. Horner, the holders of the whole of the present importation of this juice, inform me that it was purchased of the Arabs up the Red Sea, by a merchant, who was assured by the vendors that it was very fine aloe juice, and had not been boiled or otherwise altered. It was imported into London by way of Madras, in casks each containing six cwt. I am informed that the contents of some of the packages have undergone decomposition during the voyage.

Its consistence is that of treacle or very thin honey; its color deep orange or palm-oil yellow; its odor powerful, fragrant, and resembling that of fine Socotrine aloes. By standing it separates into two parts,—an inferior, paler colored, opaque, finely granular portion, and a superior, darker colored, transparent liquid. The latter forms, however, a very small portion of the whole mass.

When the granular portion is submitted to microscopic examination, it is found that the opacity and granular appearance arise from myriads of beautiful prismatic crystals. If a temperature of 132° Fah. be applied to the juice these crystals melt or dissolve, and the juice becomes deep red and transparent; and

when the liquid becomes cold it retains its transparency and does not deposit any crystals. By evaporation the juice yields a solid, transparent extract, having all the characters of fine Socotrine aloes, in which no traces of crystalline texture can be discovered. Mr. Jacob Bell has ascertained that 14lbs. of the juice yield 8lbs. 12ozs. of solid extract, or 62½ per cent. When the juice is mixed with cold distilled water, it becomes opaque yellow, and renders the water turbid, but is not miscible with it. If, however, heat be applied, the juice dissolves in the water, forming an almost clear, rich red liquid. As the solution cools, it at first becomes turbid owing to the separation of an opaque yellow precipitate, which, apparently, is the crystalline principle in an amorphous form. This gradually separates from the liquid and collects as a clear resiniform mass (commonly called the *resin* of aloes) at the bottom of the vessel, leaving the supernatant liquid tolerably clear. If the juice be shaken up with rectified spirit of wine an uniform clear mixture is obtained, from which numerous yellow crystals rapidly fall to the bottom of the liquid. Similar results are obtained when we mix the juice with equal parts of rectified spirit of wine and water.

This crystalline constituent of Socotrine aloes is doubtless, either the *aloin** described by Messrs. T. & H. Smith, of Edinburgh, and by Dr. Stenhouse, or a principle closely allied to it. Dr. Stenhouse, to whom I have given a sample of it, is now engaged in its investigation; and in a letter which I have received from him, he says, that though he has not been able to get the aloin ready for analysis, yet, from the experiments he has already made with it, he has scarcely a doubt that it will be found identical with that formerly obtained from Barbados aloes. It forms, he adds, a precisely similar combination with bromine, and, in short, agrees with it in every particular; I shall, therefore, provisionally term this crystalline principle the *aloin of Socotrine aloes*. On comparing it with a fine specimen of aloin kindly presented to me by Messrs. Smith, I find its crystals smaller and more tapering—the summits of the crystals being more acute.

In drying, the crystals of the Socotrine aloin have a strong tendency to break up; so that crystals which in the moist state

*See American Jour. Pharm. vol. xxiii. page 238.

are moderately large and regular, become small and pulverulent when dry. Like the aloin crystals of Messrs. Smith, the aloin crystals of Socotrine aloes strongly doubly refract and depolarize light, and are, therefore, beautiful objects when viewed by the polarizing microscope.

The crystals of aloin contained in Socotrine aloe juice cannot be confounded with the crystals of oxalate and phosphate of lime found in the juices of various plants, and which are called by botanists *raphides*. The appearance under the microscope of the former is very different from that of the latter. Moreover, the ready fusibility, solubility, and complete combustibility of aloin crystals easily distinguish them from the calcareous salts just referred to. On platinum foil the aloin burns without leaving any residue, except such as may arise from the presence of traces of some foreign matter.

Aloin may be readily obtained from the juice by mixing the latter with spirit (either rectified or proof,) and collecting and drying the precipitate. When procured in this way it appears to the naked eye like a yellow powder; but when examined by the microscope it is found to consist of minute fragments of crystals.

The tincture from which the aloin has been separated, yields by distillation a spirit having the fragrant odor of the juice; showing that the latter contains some volatile odorous principle. By evaporation the tincture yields a resiniform extract.

In the first edition of my *Elements of Materia Medica*, published in 1840, I have stated, that by digesting hepatic aloes in rectified spirit of wine, a yellowish granular powder is obtained, which is insoluble in [cold] water, alcohol, ether, and dilute sulphuric acid, but is readily soluble in a solution of caustic potash, forming a red colored liquid. The powder-like residue here referred to, is identical with the aloin of Socotrine aloes. When examined by the microscope, it is perceived to consist of very minute prismatic crystals, which depolarize polarized light like the larger crystals of aloin above referred to. I think, therefore, that it may be safely inferred that hepatic aloes has been prepared without the employment of artificial heat, and that its opacity is due to the presence of minute crystals of aloin.

When Socotrine aloes is digested in rectified spirit an insoluble portion is also obtained; but its color, instead of being yellow,

as in hepatic aloes, is dark brown. On submitting this dark brown insoluble portion to microscopic examination, I find that it contains depolarizing crystals.

Artificial Socotrine aloes (prepared by evaporating this aloe juice) also yields, when digested in rectified spirit, a dark brown insoluble portion.

I think, therefore, that Socotrine aloes differs from hepatic aloes in the circumstance of its having been prepared by the aid of artificial heat; by which its aloin constituent has become altered. This inference is furthered substantiated by the fact, that after it has been melted, hepatic aloes is found to have acquired the clearness and transparency of the Socotrine sort.

The clear supernatant portion of aloe juice, from which the above crystals have subsided, would probably also yield, by spontaneous evaporation, an extract resembling, or identical with, Socotrine aloes.

That Socotrine and hepatic aloes were obtained from the same plant, and were not different species of aloes, I have long suspected; and in the first edition of my work on Materia Medica, published in 1840, I have observed that "the similarity of the odor of Socotrine and hepatic aloes leads to the suspicion that they are obtained from the same plant; and which is further confirmed by the two being sometimes brought over intermixed, the Socotrine occasionally forming a vein in a cask of the hepatic aloes."

This intermixture of the two sorts of aloes in the same cask might be explained by supposing that the consolidation of the clear portion of the juice has produced the so-called Socotrine aloes; while the opaque aloin-containing portion of juice has yielded what is termed hepatic aloes.

In the third edition of my work above alluded to, I have stated that the name of *opaque liver-colored Socotrine aloes* might with propriety be applied to hepatic aloes. But until the present time I have been unable to offer a plausible explanation of the cause of the difference in these two commercial kinds of aloes.

From the preceding remarks I think we may infer:

1. That *aloin* pre-exists in a crystalline form in the juice of Socotrine aloes.

2. That the substance which deposits as a decoction of Soco-

trine aloes cools, and which is usually termed the *resin* or the *resinoid* of Socotrine aloes, is the aloin in a modified state.

3. That hepatic aloes* is the juice of the Socotrine aloes plant which has been solified without the aid of artificial heat.

4. That hepatic aloes owes its opacity to the presence of minute crystals of aloin.

5. That the juice of Socotrine aloes yields, when evaporated by artificial heat, an extract possessing all the properties of commercial Socotrine aloes.—*Pharm. Journ. April*, 1852.

ON THE DISTILLATION OF OIL OF CLOVES AND THE PREPARATION OF BENZOIC ACID BY MEANS OF SUPER-HEATED STEAM.

By Professor E. A. Scharling.

The use of super-heated steam has been advantageously applied in various branches of manufacture, such as the carbonization of wood, the distillation of mercury, the preparation of plaster of Paris, &c. There is, however, no use to which it has been more successfully applied that to the distillation of palm oil, cocoa-nut oil, tallow, and other fatty substances, used in the manufacture of Stearic candles, a manufacture which has now become of considerable commercial importance. There can be no reason to doubt that the use of super-heated steam may also be advantageously applied to the preparation of various Pharmaceutical products. The following is an account of some experiments made by Professor Scharling on the distillation of oil of cloves :—

On passing a current of super-heated steam into a metallic cylinder half-filled with bruised cloves and pieces of pumice-stone, the size of a pea, there were obtained from one pound of Amboyna cloves, of first quality, two ounces and a half of oil, together with

*By the term "*hepatic aloes*" I mean the opaque liver-colored aloes imported into England from the East Indies (usually from Bombay.) This sort of aloes is very different from the *hepatic Barbadoes aloes*, which formerly appears to have been exclusively called "hepatic aloes."

as much water as made the whole produce up to eight pounds in weight. In operating in the same manner on a pound of Bourbon cloves, of first quality, two ounces of oil were extracted on the first day in four hours, and on continuing the operation on the following days an additional half-ounce of oil was obtained. This latter quantity of oil was nearly all obtained in the first two pounds of water which came over. Thus in eight hours additional working, sixteen pounds of water were distilled over, without obtaining a larger result than that given in the first five hours of the preceding experiment.

A third experiment was then made on two pounds of Bourbon cloves, of second quality, and in the course of eight hours three ounces and three-quarters of oil and sixteen pounds of milky water were obtained. In order to collect the principal part of the oil contained in this milky water, and to ascertain whether any advantage would accrue from submitting the cloves to another distillation, all the different cloves which had been previously operated upon, together with the water drawn over, were placed in an ordinary still. On distillation, the first eight pounds of water gave about one ounce of oil. The water which came over afterwards was quite limpid, and after settling several hours no oil whatever separated from it. The apparatus employed in this distillation, consisted of a tinned brass cylinder pierced with holes, eight inches long and five inches in diameter, placed within another and larger cylinder seven inches in diameter; the space between the two cylinders being filled with husks of rice or other analogous material to prevent the escape of heat. To this apparatus is connected a Woulf's bottle, containing a small quantity of water, one orifice of which communicates with the apparatus, and the other with a Liebig's condensing tube. The bottle is covered with flannel. It is thus evident, that with an apparatus as above described, and a due supply of super-heated steam, a large quantity of oil may be obtained in a short time with little expense.

Benzoic acid may also be prepared in the same way; about eight per cent. of the weight of the benzoin used being obtained. The odor of the acid furnished by this process is the same as that obtained in the ordinary manner.

Super-heated steam is readily obtained by passing a current of

low-pressure steam through a coil of pipe, heated to such a point as to be capable of raising the temperature of the steam passing through it to the degree of heat required for the purposes of distillation.—*London Pharm. Journ. April*, 1852.

ON OIL OF CLOVES.

By George Von Hees.

1. Ten pounds of Amboyna cloves yielded in six distillations thirty-one ounces, sp. gr. 1.040.

2. Eight pounds of Bourbon cloves yielded in six distillations twenty-one ounces, sp. gr. 1.034.

3. Twenty-five pounds of Amboyna cloves yielded in six distillations seventy- four ounces, sp. gr. 1.033.

4. Twelve-and-a-half pounds of Bourbon cloves yielded in six distillations thirty ounces, sp. gr. 1.043.

5. Twelve-and-a-half pounds of Amboyna cloves yielded in six distillations thirty-two ounces, sp. gr. 1.038.

6. Twenty-five pounds of Amboyna cloves yielded in six distillations seventy ounces, sp. gr. 1.036.

These experiments show an average of the sp. gr. of 1.0375, and of the oil obtained from ninety-three pounds, two and one-ninth ounces per pound. A quarter of a hundred weight of clove-stalks (*Stipit. caryophill.*) yielded only sixteen ounces of oil of sp. gr. 1.049, differing considerably from the genuine oil in odor and color. All these oils were first prepared by conducting a direct current of steam into the paste-like mass formed by the cloves with water. After the greater portion of water had gone over, it was cohobated, and the distillation continued from without, with condensed vapors of the pressure of three atmospheres.—*Pharm. Jour. April* 1, 1852, *from Archiv. de Pharmacie*, January, 1852.

RESEARCHES ON THE DECOLORIZING PROPERTY OF CHARCOAL AND SEVERAL OTHER BODIES.

By M. E. Filhol.

It is commonly stated that charcoal is the only simple body possessing the property of absorbing coloring matter dissolved in a liquid: it further appears from the works of MM. Bussy and Payen, that decoloration by charcoal is a purely physical phenomenon.

Several compound bodies (alumina, sulphate of lead prepared by the moist way, hydrate of lead) also partake of the property of decolorizing liquids; but it is generally considered by Chemists that the action exercised by oxides on coloring matter in the preparation of lacs is chemical, differing in this respect from that of charcoal; nevertheless, Berzelius was of opinion that the decoloration effected by the oxides and metallic salts, resembled that produced by charcoal.

In the paper which I now submit to the judgment of the Academy, my object has been to prove,

1. That charcoal is not the only simple body possessing the property of decolorizing liquids: sulphur, arsenic, iron obtained by the reduction of the hydrated sesquioxide by hydrogen, are all possessed of decolorizing power.

2. That the number of compound bodies having an appreciable decolorizing power, are more numerous than has been thought, and that this power appears to depend much more on the state of division of these bodies, than on their chemical qualities.

3. That such bodies which easily appropriate one coloring matter, may have but little tendency to do so with another; thus, phosphate of lime from bones (artificially obtained) scarcely decolorizes the sulphindigotate of soda, whilst it exercises a more energetic influence on tincture of litmus than does animal black.

4. That the decoloration, in the majority of cases, is a purely physical phenomenon; thus, the same coloring matter is absorbed by metalloids, metals, acids, bases, salts, and organic substances: it is easy, moreover, by employing suitable solvents to take again the coloring matter in an unaltered state from the body which had absorbed it.

I do not doubt but that these practical data may become the subject of applications useful to analytical chemistry and industry.

The following results, which I have extracted from my memoir, will give some idea of the energy with which certain decolorizing matters act.

My observations have been made by the aid of one of Collardeau's double lunette colorimeters.

The Decolorizing Power of different Substances, compared to that of Purified Animal Charcoal, reckoned as equal to 100.

	Litmus dye.	Sulphindigotate of Soda.
Charcoal	100.	100.
Pure hydrate of iron	128.90	1.97
Alumina	116.	9.91
Phosphate of lime	109.	1.97
Iron reduced by hydrogen	95.33	100.
Milk of sulphur	26.67	0.
Binoxide of manganese (natural)	88.90	13.80
Indigo	80.	13.50
Oxide of zinc	80.	6.55
Stannic acid	70.40	0.
Antimonic acid	66.66	1.97
Chromate of lead	70.40	2.92
Litharge	66.66	3.85
Sulphate of antimony (natural)	59.25	0.
Sulphate of lead	50.	13.80
Binoxide of copper	26.67	0.
Protochloride of mercury	22.22	0.
Sulphate of baryta (artificial)	50.	0.
Sulphate of lead (artificial)	130.	16.67

Pharm. Jour. April 1, 1852, *from Comptes Rendus.*

RESEARCHES ON POPULINE.

By M. Piria, in a letter to M. Dumas.

You are aware that in 1830 M. Braconnot announced the discovery of a crystalline substance, which he had succeeded in extracting from the leaves and bark of the aspen (*Populus tremula*, and which he called populine. A recent investigation of this substance has led me to the following results :—

After having unsuccessfully attempted to resolve populine by means of synaptase, I had recourse to other agents; and the reactions which I have observed have led me to regard this substance as a complex group, resulting from the union of benzoic acid,

saligenine, and grape-sugar into one molecule. The products of decomposition by the action of various reagents are precisely the same as those which would result from the metamorphosis of the secondary groups which it contains. Thus with a mixture of bichromate of potash and sulphuric acid, populine yields hydruret of salicyle very abundantly; on ebullition with concentrated nitric acid, it is converted into nitrobenzoic acid, trinitrated phenic acid and oxalic acid; lastly, under the influence of acids, it is decomposed into benzoic acid, saliretine and grape-sugar.

The elementary constitution of populine is represented by the formula $C^{40}H^{22}O^{16} + 4Aq$. At 212° it parts with its 4 equivs. water, and becomes perfectly anhydrous. This formula results from the union of equal equivalents of benzoic acid, saligenine and sugar, with elimination of 4 equivs. water, as seen by the following equation:—

$$C^{14}H^{6}O^{4} + C^{14}H^{8}O^{4} + C^{12}H^{12}O^{12} - 4HO = C^{40}H^{22}O^{16}.$$

We might also regard populine as the result of the union of a molecule of benzoic acid with a molecule of salicine less 2 equivs. of water; we should then have—

$$C^{26}H^{18}O^{14} + C^{14}H^{6}O^{4} - 2HO = C^{42}H^{22}O^{16}.$$

This mode of viewing its molecular constitution having led me to foresee the possibility of converting populine into salicine, I made some experiments in this direction, by which my suppositions have been realized with unexpected success. It is merely requisite to boil some populine with barytic water to obtain in a few minutes a perfectly limpid and colorless solution, which, after separation of the excess of baryta by a current of carbonic acid, contains nothing further than benzoate of baryta and salicine. The salicine thus prepared is decomposed, under the influence of synaptase and acids, like ordinary salicine, and behaves absolutely in the same manner towards other reagents. Two analyses of the artificial salicine gave the following numbers:

Carbon	54·20	54·65
Hydrogen	6·36	6·41

which are identical with those which had been obtained by the analyses of ordinary salicine.

If populine be dissolved in the cold in 10–12 times its weight of pure nitric acid of 1·30 spec. grav., it produces a new substance,

which I call benzohelicine. Benzohelicine is not decomposed by synaptase; but under the influence of acids and alkalies it is resolved into hydruret of salicyle, benzoic and grape-sugar. Consequently this substance stands in the same relation to helicine as populine to salicine; and it will perhaps be advisable to substitute the term benzosalicine for the word populine. Benzohelicine is converted into helicine when boiled with caustic magnesia, which removes from it the benzoic acid it contains, without altering the helicine.

Before concluding this letter, allow me to communicate another fact, which may prove interesting to some chemists; it is the existence of the homologue of acetone in the æthalic series. Æthalone is obtained with the greatest facility by distilling æthalic acid quickly with an excess of slaked lime. In order to purify it, it is crystallized several times from boiling alcohol; it separates in thin nacreous plates, which have the following composition :—

Carbon - -	82·46	82·94	62	= 372	82·67
Hydrogen	13·94	14·04	62	62	13·73
Oxygen -	..	..	2	16	3·55

Chem. Gaz. March 1, 1852, *from Comptus Rendus.*

ON THE MANUFACTURE OF OXALIC ACID.

Oxalic acid is formed by the action of nitric acid on a great number of vegetable substances, such as sugar, rice, starch, washed sawdust, &c.

Sugar, either in its crystalline state or in that of molasses or treacle, is the substance more commonly employed in the manufacture of oxalic acid.

On the addition of nitric acid to the saccharine solution and exposure to heat, a substitution of part of the oxygen of the nitric acid for the hydrogen of the sugar is effected, oxalic acid being formed and deutoxide of nitrogen evolved from the liquor. Other changes than this however take place; carbonic acid is often disengaged with the deutoxide of nitrogen, and saccharic acid and other products remain in solution with the oxalic acid.

Instead of cane-sugar or treacle, the saccharine substance formed by the action of sulphuric acid on potato or other starch (as in Mr. Nyren's process) is employed. For this purpose the potatoes are well washed, and then reduced into a fine pulp by rasping, grinding, and other suitable means; such pulp is then washed two or three times by placing it in water and well stirring it therein, then permitting the pulp to subside, and running off the water. The pulp thus obtained is next placed in an open vessel of lead, or wood lined with lead, with as much water as will allow of the mixture being boiled freely by means of steam passed through leaden pipes placed therein. Into the mixture of pulp and water about 2 per cent. by weight (of the potatoes employed) of sulphuric acid is to be stirred in, which will be at the rate of from 8 to 10 per cent. of acid on the quantity of farina contained in the potatoes; the whole is now to be boiled for some hours until the pulp of the potatoes is converted into saccharine matter; the completion of this process being readily ascertained by applying a drop of tincture of iodine to a small quantity of boiling liquor placed on the surface of a piece of glass, when, if there be any farina remaining unconverted, a purple color will be produced. The saccharine product thus obtained is then filtered through a horse-hair cloth, after which it is carefully evaporated in any convenient vessel until a gallon of it weighs about 14 or 14½ lbs. It is now in a proper condition to be employed in the manufacture of oxalic acid, by the application of nitric acid, as in the case of operating upon sugar or treacle. Horse-chestnuts, deprived of their outer shells, are also applicable to the manufacture of oxalic acid when treated in the way above described for potatoes.

Instead of operating with sulphuric acid, the farina of potatoes and of chestnuts may be treated with diastase, and converted into a liquor similar to that obtained after evaporation from the farina and sulphuric acid before mentioned, using about the same proportion of diastase as above directed for sulphuric acid. In this case the liquor is made of the required strength at once, and the processes of filtration and evaporation are rendered unnecessary.

The apparatus required in the conversion of the saccharine matter (whether of cane-sugar or formed of starch in the way above mentioned) into oxalic acid is very simple. Usually, earthenware jars of about two gallons capacity, are employed, which, when

charged with nitric acid and the saccharine material used, are placed in water-baths capable of holding a hundred or more of these jars. These baths are constructed of brick and lined with lead, and are heated by means of steam passed through coils of lead pipe placed therein.

Instead of earthenware jars, vessels of lead, or of wood lined with lead, may be employed in the manufacture of oxalic acid. For this purpose, square open vessels, 8 feet square and 3 feet deep, are a convenient size, the liquor being heated by means of steam passed through a coil of lead pipe. A coil of about 48 feet of one-inch pipe, in a vessel of the size above mentioned, is sufficient to keep the liquor at the required temperature. In using these vessels, the liquor (whatever it may be) to be converted into oxalic acid is put into them, together with the acid employed, and heated until the required decomposition is effected. The liquor is then drawn off by a syphon, or by a cock placed at the bottom of the vessel, into shallow leaden vessels, or wooden vessels lined with lead, to cool and crystallize, and the mother-waters are drawn off from the crystals and used in the next operation.

When the manufacture of this acid is conducted in large vessels as above mentioned, the specific gravity of the nitric acid employed may be less than when the earthenware jars are used. From 1.200 to 1.270 are about the limits of the range allowed for the gravity of the acid. As regards the temperature of the baths, this should be maintained at or about 125° F. Whilst the operation is in progress, the active evolution of gas, without the appearance of red fumes, and the emission of a peculiar smell, slightly indicative of the presence of nitric oxide, are amongst the signs that everything is in good working condition. The judicious addition of sulphuric acid is found to contribute to an increase of the quantity of oxalic acid produced. The product of acid from a given quantity of sugar has been much understated by chemical writers; this has most probably arisen from the circumstance of boiling the sugar with strong nitric acid, by which means a large quantity of oxalic acid becomes converted, as soon as formed into carbonic acid; and the result is, that the actual product of oxalic acid obtained represents only about one-half of the sugar employed, and therefore not above one-half the quantity which should have been

obtained. Thus we find it stated, that from 50 to 60 lbs. of oxalic acid are obtainable from 100 lbs. of good sugar, whereas the quantity actually obtained in practice is from 125 to 130 lbs. Treacle of course gives a smaller product, 100 lbs. of fair quality yielding from 105 to 110 lbs. of oxalic acid.

The mother-liquor having been poured off, the crystals of acid obtained are thrown on drainers and washed, and then carefully dried in a suitable stove. The mother-liquors, when treated with a fresh supply of nitric acid and treacle, are ready for a further operation.

About $4\frac{3}{4}$ cwts. of nitrate of soda and $2\frac{1}{2}$ cwts. of sulphuric acid are used to furnish the nitric acid required to convert 1 cwt. of good sugar into oxalic acid.

Mr. Jullion has patented a process for the conversion of formic acid into oxalic acid. For this purpose, formic acid is saturated with a solution of caustic potash, and then half the quantity of caustic potash required for saturation is added to the above mixture; the whole is then evaporated to dryness, and heated to 560° F. By this process, the formic acid is decomposed, and oxalate of potash formed. Caustic soda may also be employed instead of caustic potash.

The oxalate of potash or of soda thus obtained is then treated with sulphuret of barium, hydrate of baryta, or any soluble salt of baryta, whereby an oxalate of baryta is precipitated, from whence pure oxalic acid may be obtained by means of sulphuric acid.

Another mode of obtaining oxalic acid is by the process patented by Dr. Wilton Turner, who directs the uric acid obtained from guano to be treated with peroxide of lead or manganese suspended in water, at a boiling temperature, by which means it will be decomposed into oxalic acid, allantoin and urea. The oxalic acid forms an insoluble compound with the lead or manganese. The lead process is as follows:—A known weight of uric acid is placed in an open cylindrical iron vessel, capable of holding 2 lbs. of water for every pound of the acid, and adapted to boil by steam. A clear saturated solution of lime-water is then added, and as soon as it is heated and in brisk ebullition, the peroxide of lead is added in successive portions as long as it is observed to be whitened by the boiling liquid. The whitish powder thus obtained is oxalate

of lead. About 240 lbs. of peroxide of lead are required for each 168 lbs. of uric acid employed. The supernatant liquor is next drawn off, and the oxalate of lead washed with clear water; this is then boiled with dilute muriatic acid (equal parts of acid and water,) by means of which oxalic acid is obtained in solution, which is evaporated and crystallized, whilst muriate of lead remains as the precipitate.

The allantoin is also decomposed into oxalic acid and ammonia by boiling it with caustic alkali. The former unites with the alkali used, while the ammonia passes over, and may be collected as liquid ammonia; the oxalic acid thus generated may be obtained as oxalate of potash if potash be the alkali employed, or as oxalic acid if baryta be used, by decomposing the latter oxalate by means of sulphuric acid. In this case the oxalate of baryta may be treated in the way previously described for oxalate of lead.

As regards these various methods of obtaining oxalic acid, their employment will of course always be a question of £ *s. d.*, the economy of many operations of manufacturing chemistry being often dependent upon their adaptation to the requirements or purposes of particular manufacturers, in connection with other branches of manufacture carried on by them.

The low price at which treacle and sugar are now obtainable is much in favor of their use in this manufacture. The chief point however to which attention must be directed, in order to lessen the cost of production of this article, is in economizing the nitric acid used.

In speaking of the action of nitric acid upon sugar, it was observed that carbonic acid is produced, and that it passes off with the deutoxide of nitrogen also set at liberty. The presence of carbonic acid in this case proves a great obstacle in the reconversion of nitric oxide into nitric acid, preventing the union of the oxygen of the air with the nitric oxide. Various processes have been from time to time suggested to effect this economy in the manufacture of oxalic acid; amongst these the following may more particularly be noticed:—

In 1846, Mr. Jullion patented a method of converting the oxides of nitrogen, given off in the manufacture of oxalic acid, into nitrous and nitric acids. For this purpose he uses a "generating

vessel," which is a vessel something like a Woulf's bottle, only having a moveable top fitting air-tight, and capable of holding about 100 gallons. The materials to form the oxalic acid are introduced, and the vessel heated by a water-bath (by steam or other convenient means,) which surrounds the vessel; a quantity of nitric acid is then added, and air or oxygen is forced in through a pipe inserted in the top. The oxygen, coming in contact with the evolved oxides of nitrogen, immediately converts a portion into nitrous and hyponitrous acids, which are partly again absorbed by the fluid in the vessel; another portion passes off by a pipe inserted in the upper part of the vessel, which pipe passes through a furnace. This part in the furnace is a little enlarged, and is heated to from 600° to 900° F.; this part of the pipe or tube contains spongy platinum, or other similar substances. The gases, on coming in contact with the heated platinum, combine to form nitric acid, which is afterwards condensed in vessels arranged as usual in the manufacture of this acid. Instead of platinum, a close vessel containing water may be used, which decomposes hyponitrous and nitrous acids, giving rise to nitric acid. This principle is applied in the following ways:—The oxides of nitrogen, as evolved from the liquor in the decomposing vessel, coming in contact with oxygen, are converted into hyponitrous and nitrous acids, which, upon being mingled with steam, are decomposed into nitric acid and deutoxide of nitrogen; or the introduction of steam may be obviated by using heated air or oxygen in the decomposing vessels, by which means moisture will be furnished from the liquor; the amount of evaporation thus caused will also prevent an inconvenient increase of the mother-liquor. The compounds thus formed, when passed through suitable condensers, will, if the supply of atmospheric air or oxygen has been in excess, be all or nearly all condensed into nitric acid.

The following is a description of Crane and Jullion's continuous method of manufacturing oxalic acid and nitric acid at one process: The oxalic acid mother-liquor of a previous process is placed in a closed or covered vessel termed a "generator," formed of slate; nitric acid and syrup in the usual proportions employed for such quantity of mother-liquor, are also placed separately in feeding vessels, over the "generator;" heat is then applied to the mother-

liquor, and the temperature raised as quickly as possible to 180° or 200° F. Streams of nitric acid and syrup are then caused to flow into the generator by means of suitable stop-cocks and funnel-pipes, in such a quantity that the delivery of the whole shall occupy about eighteen hours, at the expiration of which time the process will be completed.

The gases arising from the decomposition of the materials so supplied pass off through an eduction-pipe in the top of the generator into a receiver, into which a stream of chlorine is introduced (from a chlorine-generator) sufficient to convert the whole of the oxides of nitrogen into nitric acid. A portion of the water in the receiver is decomposed, its oxygen combining with the oxide of nitrogen to form nitric acid, whilst its hydrogen combines with the chlorine to form hydrochloric acid. These mixed vapors pass over into suitable condensing vessels placed to receive them. The whole of the nitric acid and syrup having been run in, and the liberation of the gases or oxides of nitrogen having ceased, the oxalic acid liquor is drrawn off from the generator and crystallized.

Messrs. McDougall and Rawson have also patented a method of recovering the vapors which pass off in the manufacture of oxalic acid. To effect this, they direct the employment of a series of vessels containing water, into the first of which the nitrous gas or fumes are passed through a tube dipping below the surface of the vessel; air is also admitted, which mixes with the gas bubbling up through the water. Attached to the last vessel of the series is a pneumatic apparatus, by means of which the mixture of nitrous gas and air is drawn through this series of vessels, each containing a tube dipping into the liquid, and another tube or pipe attached to its top to connect it with the next vessel. The nitrous gas thus passing alternately into air and water, becomes converted into nitric acid. In this process the following reaction is said to take place:—

On $3NO^4$ being passed into water of the temperature of 100°F., or upwards, $2NO^5+NO^2$ result, the $2NO^5$, *i. e.* 2 atoms of nitric acid, remain in solution, whilst the NO^2, which is an incondensable gas, bubbles through the liquid and unites with the air in the vessel above the liquid; it immediately takes 2 atoms of oxygen

from the air and becomes NO^4, which, passing through the liquid, becomes nitric acid and nitrous gas as before; and thus nearly the whole the nitrous fumes or gas are reconverted into nitric acid.

In Ecarnot's patented process for recovering the nitric acid, he fills his regenerating vessels with a porous substance, such as pumice-stone, supplying the oxygen by a blowing-machine, a flow of steam being brought from a boiler.—*Chemical Gazette, March* 15, 1852.

APPLICATION OF ORGANIC CHEMISTRY TO PERFUMERY.

From a Letter written by Dr. Hofmann to Prof. Liebig.

The beautiful investigations of M. Cahours upon the oil of *Gualtheria procumbens*, which have made us acquainted with the nature of this compound, so much used in perfumery, appears not to have been lost sight of in the arts.

The arrangement of the oil of winter-green in the group of the compound ethers, could not do otherwise than direct the attention of the manufacturers of perfumery to this extensive class of bodies, the number of which is still further daily increased by the active energy devoted to the field of organic chemistry. The remarkable fruity odor of many of these ethers had not been overlooked by chemists; but it was reserved for practical men to make the selection and ascertain the proportions in which certain of these compounds resembled in so great a degree the aroma of particular fruits, that we almost feel ourselves led to the idea, that these very compounds are the cause of the odor of the fruits in question, and that they would be found in them, if the processes were followed on a sufficiently large scale.

The artificial production of aromatic oils for commercial purposes has only been carried on for the last few years; but although the process of fabrication is so new, yet it appears to be already in the hands of several distillers, some of whom make tolerably large quantities. The jury were enabled to satisfy themselves of this, in their examination of the products belonging to this depart-

ment in the exhibition. We found in our surveys at the Exhibition, both in the English and in the foreign divisions, a copious selection of the chemical articles of perfumery, the applicability of which was moreover illustrated by the simultaneous exposition of the confectionary flavored with them.

Unfortunately, most of these oils were only sent in small quantities, so that the specimens which I was enabled to obtain, in few cases only allowed of accurate examination.

The compound most frequently exhibited was a liquid labelled "*pear oil*," which on examination was shown to be an alcoholic solution of pure *acetate of amylic oxide*. As I had not enough of the compound to allow of its sufficient purification for ultimate analysis, I decomposed it with potash, when free fusel oil separated, and the acetic acid was determined in the form of the silver salt. The acetate of silver gave per cent.—

Theory.	Experiment.
64·68	64·55

The acetate of amylic oxide, when obtained by the ordinary process (1 part of sulphuric acid, 1 part of fusel oil, and 2 parts of acetate of potash), evolved a remarkably fruity odor; but the agreeable odor of the Jargonelle pear was not distinct until it was diluted with 6 vols. of alcohol. On close inquiry of the exhibitors, I ascertained that tolerably large quantities of this oil (in one case 15–20 lbs. weekly) are manufactured. It is principally used for flavoring pear-drops, which are much admired in England, and which consist almost entirely of barley-sugar.

Next came the *apple-oil*. As the examination shows, it is nothing more than the valerianate of amylic oxide, and every one is at once reminded of the insupportable odor of rotten apples, which fills the laboratory, in making valerianic acid. When the crude distillate of this operation is treated with dilute alkali, the valerianic acid is separated, and an ether is obtained, the solution of which in about 5 or 6 vols. of alcohol possesses a most agreeable aroma of apples.

The essence in greatest quantity was the *pine-apple oil*, which, as you are aware, is only the butyrate of ethyle. This compound, also, like the two above, does not evolve the agreeable odor until diluted with a large amount of alcohol. Butyric ether, which in

Germany is frequently added to the inferior kinds of rum, is principally used here for flavoring a kind of lemonade (pine-apple ale). For this purpose it is however seldom prepared from pure butyric acid, but generally by merely saponifying the butter, and distilling the soap with concentrated sulphuric acid and alcohol. The liquid thus obtained of course contains other ethers besides butyric ethers, but it may be used in this state for flavoring. The specimen which I analysed appeared however to be the pure ether prepared from butyric acid. When decomposed by potash and converted into a silver salt, it yielded—

Experiment.	Theory.
55·33	55·38 per cent. of silver.

The so-called *cognac oil* and *grape oil* were sent both by English, as also French and German exhibitors. They appear to be used pretty commonly for imparting the favorite cognac odor to low brandies. Unfortunately the specimens exhibited were too small in quantity to allow of my instituting an accurate examination of these oils. The cognac oil especially was in very small quantity; on the addition of water to the whole of the sample, a few drops only separated, and these consisted of a mixture. The grape oil is also an amyle compound, dissolved in much alcohol; for when treated with concentrated sulphuric acid, the oil, freed from alcohol by washing with water, yielded sulphate of amylic oxide, which was identified by the analysis of the barytic salt. It yielded 45·82 per cent. of sulphate of baryta.

The crystallized amylo-sulphate of baryta with 2 equivs. of water, analysed by Cahours, and again recently by Kekulé, contains 45·95 per cent. of sulphate of baryta. It is certainly remarkable, that we see here a body, which on account of its insupportable odor is separated from brandy with the greatest care, again applied in an altered form to flavor this beverage.

I must also allude to the *artificial oil of bitter almonds*. When Mitscherlich, in 1834, discovered nitrobenzole, he little thought, after twenty years, to find this body in an industrial exhibition. He certainly, at that time pointed out the remarkable resemblance which the odor of nitrobenzole had to that of oil of bitter almonds: but the only sources for obtaining benzole at that time, viz. the oil of compressed gas and the distillation of benzoic acid, were

much too expensive, and put an end to the idea of substituting the use of nitrobenzole for oil of bitter almonds. However, as you recollect, by means of the well-known aniline reaction, I showed with the utmost certainty the presence of benzole in the common light oils of coal tar, which had frequently been previously suspected; and in 1849, C. B. Mansfield showed, by a careful investigation, that benzole may be procured easily, and in large quantity, from oil of coal tar. In his memoir, which contains many valuable details upon the practical applications of benzole, the possibility that the fragrant nitrobenzole may be obtained in larger quantities is alluded to. As the Exhibition shows, this remark has not been lost sight of in the arts. Among the articles of French perfumery, with the title of *artificial oil of bitter almonds*, and the fanciful name of *essence of Mirbane*, there were several specimens of oils, which on accurate examination proved to consist of more or less pure nitrobenzole. I was not enabled to ascertain accurately the extent of this fabrication; but it appears to me by no means inconsiderable. Here, in London especially, tolerable quantities of this artificial oil of bitter almonds are prepared. The very simple apparatus used is that proposed by Mr. Mansfield. It consists of a large glass worm, the upper end of which branches into two tubes, which are provided with funnels. A stream of concentrated nitric acid flows slowly through one of these funnels, whilst the other is for the benzole (which for this purpose need not be absolutely pure). At the point at which the tubes of the funnels are united, two bodies come in contact; the chemical compound formed becomes sufficiently cooled in passing through the worm, and only requires to be washed with water, and finally with some weak solution of carbonate of soda, to be ready for use. Although the nitrobenzole closely resembles oil of bitter almonds in physical properties, it posesses however a somewhat different odor, readily recognised by a practised hand. However, it answers well for scenting soap, and would be extensively applicable for confectionary and for culinary purposes. For the latter purpose it has the special advantage over oil of bitter almonds, that it contains no prussic acid.

Besides these, several other similar products were exhibited, but most of them were of too compound a nature, and in too small a

quantity to allow of their composition being accurately determined. In the case of many of these essences, their resemblance to the aromas specified was very doubtful.

The application of organic chemistry to perfumery is still in its infancy; and we may expect that a careful survey of those ethers and etherial compounds with which we are at present acquainted, and those which are daily being discovered, will lead to further results. The interesting caprylic ethers, which M. Bouis has lately discovered, are remarkable from their extremely aromatic odor; (thus the acetate of caprylic oxide possesses an odor as strong as it is agreeable), and promise, if they can be obtained in larger quantities, to yield new materials for perfumery.—*London Chem. Gaz. March* 1, 1852, *from Ann. der Chem. und Pharm.*

ON THE STEARIC CANDLE MANUFACTURE.

By Mr. George F. Wilson, Managing Director of Price's Candle Company.

(*Read before the Society of Arts, Feb. 5th,* 1852.)

The science of candle-making is indebted for its existence to the eminent French chemist M. Chevruel, who in 1811 began his researches into the nature and constituents of fatty bodies. He discovered that fat, instead of being a simple organic substance, as had been previously believed, was a salt composed of a solid animal acid (margaric) and an animal base (glycerine,) the acid being the inflammable part. In 1814, he further discovered the existence of a liquid acid (oleic) existing in lard, and forming a chief ingredient in many fatty bodies. His researches were continued for several years, and in 1823 were given by him to the world in his well known work. He has recently been presented by the *Societe d'Encouragement* with a prize of 12,000 francs.

The first successful attempt to employ commercially these scientific discoveries of Chevruel was that of De Milly of Paris, who commenced manufacturing in 1832. His candles are stamped with the word "Etoile," from the Barriére de l'Etoile, near which his works are situated. De Milly employed a modification of Chevruel's process for separating the acids from the glycerine with which they are combined. Tallow is boiled up with thin cream

of lime, which causes the acids to forsake the glycerine and combine with the lime; the acids are then set free by combining the lime with sulphuric acid, and the oleic acid is afterwards separated from the margaric by simple pressure. This is the process of lime "saponification." A large cake of margaric acid, which had been shown by De Milly at the Exhibition, was exposed upon the lecture-table.

The obstacle to the success of this process was its expense, the margaric acid requiring nearly two and a half times its weight of tallow to produce it. This obstacle was overcome by the firm of which the lecturer is a member, who in 1830 became possessed of a patent for separating cocoa-nut oil into its solid and liquid parts. In 1831, the candle manufacture was freed from the excise, and received in consequence a great impulse. The success of candles made from cocoa-nut oil was however not great, owing to their requiring snuffing; but it was discovered by Mr. James Wilson, while endeavoring to make cheap candles for the illumination on the occasion of the Queen's marriage, that from a mixture of the cocoa-nut stearine with stearic (pure margaric) acid, candles were produced, which gave a beautiful light and wanted no snuffing. These are the well known "composite candles."

The next step was the purification of the fat acids by distillation; and the first suggestion of a method of doing this was made by Mr. George Gwynne, who proposed distilling in a vacuum apparatus similar to that used in sugar refining. He afterwards, in conjunction with Mr. George Wilson and Mr. Jones, carried out his idea into practice, by distilling in an atmosphere of steam, which gave the same results as the air pump, but without its manufacturing difficulties, which were found to be almost insuperable. The process at present employed on the works of the Company is briefly as follows:—The raw material (at present palm oil) is exposed at a temperature of 350° to the action of about one twentieth of its weight of sulphuric acid, which has the effect of driving off the glycerine, and of leaving the fat acids free; these acids, which are of a very dark color, after being washed, are transferred to a still, from which the air is excluded by steam. The distilled material is subjected to pressure, first at the ordinary, and then at a high temperature, and the residue is the material of which the Belmont sperm candles are made. The process of distillation was

commenced on a large scale at their works in 1844, two years before the opening of the factory of Messrs. Masse and Tribouillet, the first established for this purpose on the Continent. Arsenic and wax were originally used by Price and Company to destroy the large crystals which were formed in their earlier candles, and which disfigured their exterior; but by pouring the stearic acid into the moulds at its congealing point, instead of at a high temperature, it was found that the crystals were no longer formed. Six kinds of candles are made at the Belmont works:—1. Belmont sperm; of hot-pressed palm acid. 2. Belmont wax; the same material, but colored with gamboge (to suit the refined prejudices of the home consumers.) 3. Best composite; of the same material as 1 and 2, but mixed with cocoa-nut stearine. 4, 5 and 6. Composite 1, 2, 3, of inferior quality. The machinery for making the candles was shown and explained; and as an example of the very large scale of the operations of the Company, it was stated that 800 miles of wick are continually being converted into candles.—*London Chem. Gaz., from Literary Gaz.*

ON THE PRODUCTION OF CHLOROFORM FROM CHLORIDE OF LIME AND THE ESSENTIAL OIL OF TURPENTINE.

By J. Chautard.

On mixing intimately in a retort 600 parts of water, 200 parts of chloride of lime and 25 of oil of turpentine, and submitting the mixture to distillation, a violent reaction occurs, and at the same time a very agreeable etherial odor is manifested. A large quantity of carbonic acid gas is disengaged, which, as it causes the matter to froth, necessitates the employment of large vessels. On removing the retort from the fire as soon as the mixture begins to rise, the operation goes on well, and continues of itself to the end. The receiver contains three layers, frequently intermixed. The first consists of essential oil, which appears to have escaped the reaction; the lower one is an etherial liquid, with the odor of chloroform; the intermediate layer consists of water, holding in solu-

tion a considerable amount of the preceding product. The latter is separated by means of a pipette, and rectified on the water-bath; two or three treatments of chloride of calcium, and a few fractional distillations, suffice to render it perfectly pure.

This product presented all the properties and the composition of the chloroform of the methylic series. It is a perfectly colorless, highly mobile liquid, with a very sweet taste and a most agreeable odor, heavier than water, in which it dissolves perceptibly, communicating to it the two preceding properties; it boils at 145°·4 F. On analysis it furnished C 10·47, H 1·03, Cl 88·59; theory requires C 10·05, H 0·84, Cl 89·11.

The slight excess of carbon and hydrogen obtained must, I think, be attributed to a small quantity of carburet of hydrogen, which tenaciously accompanies the chloroform, and from which it might perhaps be freed by distillation over sulphuric acid. This would at the same time account for the few degrees of difference between the boiling point of the substance under consideration and that admitted for chloroform.

I have no doubt that, by modifying the above process, we shall succeed in obtaining chloroform at far less expense than by the method of preparation generally in use.—*London Chem. Gaz.*, Feb. 16, 1852, from *Comptes Rendus*, Dec. 15, 1851.

ON THE HEAVY OIL OF WINE.

By Edward N. Kent.

Having occasion to use a little of the officinal oil of wine, I applied to one of our wholesale Druggists, who furnished me with an article, which I found to be useless. On testing a sample, it *mixed with water* and produced a slight milkiness. It was evidently alcohol, containing a trace only of oil. The price of this was $4 per pound.

Samples were then obtained from all the wholesale Druggists from whom it could be procured, and each of these was proved to be equally worthless, as the results of the following tests will show.

The second sample, when agitated with water, separated into two portions, one of which was aqueous and the other ethereal. The latter exposed to the air, to separate the ether by spontaneous evaporation, left a residue which was completely *soluble* in water, and proved to be alcohol. The price of this mixture of alcohol and ether was $4.50 per pound.

The third sample when agitated with water, became slightly turbid, and was dissolved. It had a pale yellow color, ethereal odor, and the sp. gr. was .909. A portion of it exposed twelve hours to spontaneous evaporation in a graduated measure, lost one-eighth of its bulk, and on the application of a taper, burned with a *blue* flame. It is quite evident that this also was alcohol with a small portion of ether, and a trace of oil. The price of this was $4.50 per pound, and it was labelled "Ol. Aetherii." It bore also the name of the *importers*.

The fourth sample, when agitated with water, became slightly turbid, and dissolved. It was colorless, had an ethereal odor, and the sp. gr. was .844. This also burned with a *blue* flame. The price of this worthless article was $6.50 per pound. It was labelled "Ol. Vini Pur," and bore also the name of the *London* manufacturer.

It may be well to remark, that the officinal oil of wine, when agitated with water, separates and falls to the bottom, being heavier than water, whence its name. The sp. gr. of the pure oil is not less than 1.05, and it has a yellow color.

The labels on the third and fourth samples above mentioned, are alone not sufficient evidence to prove that they were *imported*, but, in addition to the label, I was informed that one of them *was recently imported*, and also that the manufacturing Chemists in this country do not make or sell the oil of wine. In view of this statement (if true) the question naturally arises: How did the above worthless articles pass the Custom House under the existing law for "the prevention of the importation of spurious and adulterated drugs?"

I have examined another sample which is not offered for sale as oil of wine, but as it has properties resembling more nearly the officinal oil than either of the four samples above mentioned, it might possibly be confounded with the oil of wine. This sample had an agreeable *vinous odor*, and a *yellow* color. When agitated

with water a considerable quantity of oil separated, which was *lighter* than water. A portion of the original oil, distilled in a glass retort with a thermometer passed through a cork, inserted into the tubulure, gave about half its bulk of a colorless liquid below 180° F., which proved to be alcohol containing a small quantity of acetic ether and œnanthic ether. The residue left in the retort had the properties of a mixture of œnanthic ether and œnanthic acid. The above article has been extensively used (in connection with acetic ether) for the manufacture of factitious brandy, and is sold for about $1.50 per ounce.

After having tested samples of all the different articles offered for sale under the name of "oil of wine" by the wholesale Druggists of New York, without being able to find either of them worthy of the name, I prepared a little for my own use, by the following process, which is that of the London Pharmacopœia :

2 lbs. oil of vitriol were carefully mixed with 1 lb. commercial alcohol, and distilled very slowly in a glass retort. The product consisted of two portions, the lightest of which was an ethereal solution of oil of wine measuring 6 oz. This was exposed to the air for twenty-four hours, to remove the ether by spontaneous evaporation. The residue, washed with a little dilute solution of potash and dried, was pure "Heavy Oil of Wine," and weighed half an ounce. The quantity obtained, though small, corresponds exactly with the proportion obtained by Hennel at the Apothecaries' Hall, London, viz : 17 oz. oil of wine from 34 lbs. alcohol, and 68 lbs. oil of vitriol.

By a simple calculation of the cost of manufacture, and expense of importation, it will be seen that pure oil of wine could not be imported and sold at the prices asked for the samples above mentioned. In making this calculation it will be necessary to observe that under the existing excise law the price of alcohol in England is much higher than in the United States, and is now, I am informed, from 17 to 18 shillings sterling per gallon. The following calculation (based on the results of Hennell's process) gives the cost of *pure* oil of wine, manufactured in England and imported into this country, at $35 per pound; but the spurious articles now sold for oil of wine, are offered at prices varying from $4 to $6.50 per pound.

34 lbs. alcohol (about 5 gallons) at 17 shillings sterling per gallon, - - - - - - - -	\$18 70
68 lbs. oil of vitriol, at $2\frac{1}{2}$ cents per pound, - -	1 70
Labor, fire, packing, bottle, &c., - - -	1 50
Cost of 17 oz. oil, to the English manufacturer, -	\$21 90
Or per pound,	
Cost of making 1 lb. pure oil in England, - -	\$20 61
Manufacturer's profit, say 10 per cent., - -	2 06
Wholesale price in England, - - - - -	\$22 67
Duties paid by importer, 30 per cent., - -	6 80
Charges paid by importer, 10 per cent., - -	2 26
Cost of importation, - - - - - - -	\$31 73
Profit on importation, - - - - - -	3 27
Wholesale price of the imported oil, - - - -	\$35 00

I regret that I have been unable to find the price of pure oil of wine quoted in the lists of any of the manufacturing chemists, but think it fair to infer that if the article is offered for sale, of English manufacture, at less than \$2 per ounce, that impurity or adulteration may be suspected, and in this case I would recommend the following process for testing its purity.

Agitate a small portion of the oil in a test tube, with an equal measure of water. If it dissolves, reject the sample as impure, but if the mixture separates into two portions, after standing at rest for a few moments, put it on a paper filter, previously well moistened with water. The water in the mixture will pass through the moistened filter, leaving ether or oil upon it. If this is colorless or very pale yellow, it should be exposed a few hours to spontaneous evaporation, to ascertain if it contains oil. But if it is yellow and heavier than water, this portion may consist of oil of wine; this, however, should be verified by observing the odor and sp. gr. of the oil. By carefully operating upon a *known* quantity in the above manner, the *proportion* of alcohol or ether (if present) may be easily determined.

As the efficacy of Hoffman's Anodyne is due to the heavy oil of wine contained in it, and as the proportion of this oil to the other

constituents is small, it is particularly necessary that the oil should be pure. The high price of alcohol in England, and a defect in the directions formerly given for its preparation in the United States Dispensatory, are the probable causes of the absence of pure oil of wine in New York. In recent editions of the above work,* the defective proportions have been substituted by those of the London College, and there is now no reason why pure oil of wine should not be made in the United States, where alcohol is cheaper, probably, than in any other part of the world. I hope that our manufacturing chemists will turn their attention to this subject, and displace all worthless chemical and pharmaceutical preparations by such as will be useful to the public, and creditable to the manufacturers.—*N. Y. Journ. Pharm., March*, 1852.

[The United States Pharmacopœia directs two pints of alcohol (sp. g,. ·835) to be mixed with three pints of sulphuric acid (sp. gr. 1.845 ;) by weight rather better than 3.3 of the acid, to one part of alcohol, and gives 1·096 as the sp. gr. of the oil.—Ed. *N. Y. Journ. Pharm.*]

*The proportions of alcohol and sulphuric acid directed in the U. S. Pharm., are not taken from the Lond. Pharm., but are the suggestion of the revising committee, founded on experiment. The acid is in greater excess, which, by causing the boiling point to rise sooner above the ether producing temperature, increases the oily product and decreases that of the ether.—*Ed. Am. Journ. Pharm.*

ON GRECIAN SPONGES.

By M. Landerer, of Athens.

The sponge trade forms no unimportant branch of Grecian commerce, the annual export being 150,000 litres. The principal divers are Hydriots, Spezziots, and Candiots; these occupy themselves especially in this branch of business. Yet more skillful divers are the Calimniots and the Simiots, inhabitants of the little Turkish islands, Calimnos and Simi.

The sponge fishery begins in May. At that time, from thirty to fifty little vessels, with red-brown sails, may be seen at once on the waters of the Grecian Archipelago, gliding among the

islands, seeking sponges. For the purpose of more easily distinguishing the sponges at the bottom, they have a dish containing fine sand and oil thoroughly mixed; a portion of this being scattered upon the sea, spreads itself around, and forms a layer of extreme tenuity upon the surface, by which the transparency of the water is much increased; they are now able to discern the bottom, which before was quite impossible. The naked diver, begirt with a strap, in which is placed a large and strong knife, now takes his place at the side of the vessel; as soon as he espies a sponge, he dives to the bottom, cuts it loose, and holding it in his hand, reappears upon the mirror-like surface of the sea, and resumes his station.

The sponges so obtained, are carried to some low and sandy beach, and there submitted to a cleansing and assorting process, in the following manner: Since they are covered, in the fresh state, with a slimy mass, they are first rubbed with fine sand, strung upon cords, and then subjected to the action of the sea, so that the movement of the water may separate as much as possible of the slimy matter, and the sponges in this way be cleansed. Afterward, when they have been exposed a long time in the sun, and frequently wet during that period with sea-water, they become whiter, and much improved in texture, while the gelatinous matter changes in its character, and by rubbing with sand is readily removed.

Thus prepared, they are assorted according to size and quality, strung upon cords, sprinkled with water, and, as they are sold by weight, well charged with sand. If our information be correct, it is worthy of note, that the slimy envelope being full of ovules, a crop of sponges is produced wherever it becomes stationary. It is also said that the divers who endeavor to tear the sponges loose with their hands, frequently experience a burning sensation throughout the entire arm.—*Central Blatt of April 7th,* 1852, *from Arch. der Pharm.*

ON A PROCESS FOR DETECTING THE PRESENCE OF WATER IN VARIOUS SUBSTANCES.

By A. Gorgue.

The presence of water in the alcohols and ethers may readily be detected by taking advantage of the property they possess of rendering benzine turbid when they contain water.

The only condition requisite for ascertaining the presence of water in a liquid is, that it must be soluble in the benzine. The following is the plan of operating, for instance, with alcohol:—It suffices to pour *one single drop* into 3–4 cub. centims. of benzine. If the drop falls to the bottom of the tube in which the experiment is made without producing any turbidity, the alcohol contains more than a third of its weight of water. To be convinced that the alcohol contains too much water for any opakeness to be produced, it suffices to add some absolute alcohol to a small quantity of the liquid, and to repeat the experiment. Every time that there is a production of turbidness, accompanied with the formation of little globules, we may be certain that the strength of the alcohol will be comprised between 65 and 93 centesimal degrees. If but a cloudiness be produced, the liquid contains at the most seven-hundreths of water. In this case the opacity may be made to disappear by the addition of some stronger alcohol. The experiment is made with benzine saturated with water, in little short dry tubes closed at one end, and of about 12 millims. in diameter.

When an ether is to be examined, essential oil of turpentine is preferable to benzine, as the turbidness produced is more persistent. It is not employed to detect the water in the alcohols, from its being less sensitive than benzine; in fact, an alcohol of 98° no longer renders it turbid.

By operating as I have stated, from seven- to eight-thousandths of water can be readily detected in an alcohol, and from three- to four-thousandths in an ether.

Any substance soluble both in the liquid under examination (alcohol, ether, &c.) and in the test for water (benzine, essential oil of turpentine, &c.) does not affect the sensitiveness of the process, which however is impracticable whenever one of the first liquids holds in solution a substance insoluble in the latter.

The property which hydrated ether possesses of rendering the oil of turpentine opake, may be applied to determine the hygrometric water in salts. It suffices to leave them in contact for a few minutes with anhydrous ether, and then ascertain whether it renders turpentine turbid. This mode of operating cannot be adopted in the case of substances insoluble in the turpentine which dissolve in the ether, or of salts which are dehydrated by the latter liquid, for instance, very efflorescent salts, such as the crystallized phosphate, carbonate and sulphate of soda. The process may be applied for detecting the presence of interstitial water in the slightly efflorescent crystalline salts, as the sulphate of copper and the sulphate of manganese, and those which are unaltered by exposure to the air, as the chloride of barium, the oxalate of ammonia, &c. Ether is preferable to alcohol in these experiments, because a smaller proportion of water can be discovered in it; and, moreover, the latter liquid dissolves, and dehydrates a larger number of salts than ether.

Taking advantage of the insolubility of water in benzine, I have been able to preserve intact, crystals of deliquescent salts, as those of the chloride of calcium and bichloride of copper; efflorescent salts, as the phosphate, sulphate and carbonate of soda; and lastly, crystals of salts which become oxidized in the air in the course of time, as the protosulphate of iron. To preserve these substances in benzine, it is only requisite that they should have been well dried on blotting paper, or wiped with a piece of fine linen. Crystals which had been kept in benzine lost all smell after they had been submitted for a short time to a somewhat brisk current of air, and had experienced no alteration in their composition or properties.—*London Chem. Gaz., Feb.* 16, 1852, *from Comptes Rendus, Dec.* 22, 1851.

ON THREE KINDS OF QUININE.

By J. Van Heijningen.

If common pure quinine be dissolved in absolute alcohol and the latter allowed to evaporate spontaneously, a resinous mass remains behind, in which acicular crystals are contained. If it be dissolved

in ether, there also remains after the evaporation a resinous substance, but in which these crystals cannot be discovered.

According to Martiny and Liebig, common quinine is obtained in crystals from an ammonical liquid. These are most easily procured when ammonia in excess is added to a solution of the neutral sulphate of α quinine, and of the sulphate of quinine with three atoms of water, and the mixure set aside. After some time very fine acicular crystals appear on the surface, which can be isolated only with difficulty, and when washed and dried form an amorphous powder. But from absolute alcohol these crystals no more crystallize than does amorphous quinine.

If, however, recently-precipitated quinine, after having been carefully washed and repeatedly moistened, be spread out as thinly as possible and exposed to the air, the amorphous precipitate is gradually converted into crystals, which can be as easily recrystallized from absolute alcohol as quinine.

This amorphous precipitate, however, which is the third hydrate of quinine, loses during crystallization two equivalents of water, and possesses now, like the first hydrate of quinine, the property of being much less soluble in spirit of wine, and of crystallizing out of the hot alcoholic solution by cooling. This quinine recrystallized from alcohol and procured, as described above, by precipitation from the common sulphate of quinine by ammonia, loses, when moistened with ammonia, and exposed for a few days to the air at 130° Cent., five per cent of water.

Quinine . .	94.935 . .	1=2025.0	94.8
Water . .	5.065 . .	1= 112.5	5.2
	100.000	2137.5	100.0

It follows, therefore, that there are three kinds of quinine which are quite distinct the one from the other, and show their peculiarity also in their salts, namely—

α quinine, which loses at 130° C., 14.3 per cent. water = 3 eq.
β quinine, which loses at 130° C., 10.8 per cent. water = 2 eq.
γ quinine, which loses at 130° C., 5.2 per cent. water = 1 eq.

The γ quinine forms like the α and β quinine, basic and neutral salts, which easily crystallize, and have much similarity with those of β quinine. The basic sulphate of this alkaloid contains much

less water than the corresponding salt of the α and β quinine. Analysis showed

γ quinine . . .	84.78 =	4050.0	. .	84.81
Sulphuric acid .	10.75 =	500.0	. .	10.47
Water	4.47 =	112.4	. .	4.71
	100.00	4662.5		100.00

The proportion of water in the corresponding sulphate of α quinine, is 14 per cent., or seven equivalents; that of β quinine, 12.9 per cent., or six equivalents; and that of γ quinine, 4.70 per cent., or one equivalent.

The γ quinine is easily prepared, and of importance for the purification of the α quinine, as it crystallizes, and can, therefore, be more easily purified.

It establishes, moreover, the presence of the β quinine beyond doubt, since it is now quite certain that all three arise from one another. For the sake of greater order, the denomination ought now to be altered, and α quinine should be called that with one atom of water; β quinine that with two atoms; and γ quinine that with three atoms of water.—*London Pharm. Jour. May 1st, from Pharm. Central Blatt.*

QUINIDINE.

By Mr. Robert Howard.

This alkaloid, which gained a prize in the Great Exhibition, has scarcely yet attracted much attention. Some of the cheaper barks now largely imported from New Grenada contain so much of it that it is, perhaps, as well that it should be more studied. The *Cinchona cordifolia*, from that part of the continent, is particularly rich in it. It is, however, contained in larger or smaller quantities in the Bolivian and Peruvian barks—the *Cinchona Calisaya, Boliviana, rufinervis,* and especially *ovata.*

The sulphate of quinidine, or β quinine as it is called by some (Van Heijningen and others,) is so like the sulphate of quinine, that the eye or the taste can with difficulty distinguish them. It

forms the same light fibrous crystallization, and occupies as large a bulk. It corresponds in appearance with the description given by Winckler, of "chinidine." (See *Pharm. Journ.* for April, 1845, vol. iv. p. 468.) He notices that it has "a remarkably white color and a peculiarly faint lustre." Its most striking characteristic is its extreme solubility. Pure sulphate of quinine requires nearly thirty times it weight of boiling water for solution, whilst the sulphate of quinidine dissolves in four parts. On the other hand the pure alkaloid crystallizes readily out of proof spirit and out of ether, whilst quinine does not crystallize out of either. A very good test for the presence of cinchonine in sulphate of quinine is also capable of being applied to detect the presence of β quinine. On this point I would refer for very interesting details to a paper by M. Guibourt, in the *Journal de Pharmacie* for January in this year.

In your Journal for April, 1843, I gave a test for sulphate of quinine, to which I would again advert, because subsequent experience has proved it to be a tolerably easy, and at the same time exact means of ascertaining its purity. Put 100 grains in a Florence flask with five ounces of distilled water, heat this to brisk ebullition; the sulphate of quinine ought not to be entirely dissolved; add two ounces more water, and again heat it to ebullition; ought to make a perfectly clear solution. If this be allowed to cool for six hours, and the crystals carefully dried in the open air on blotting paper, they will be found to weigh about ninety grains, the mother-liquor may be evaporated and tested with ether, when any cinchonine or β quinine will be easily detected. On examining sulphate of quinine of commerce from several leading manufacturers, I have found all of them give, within a grain or two, the same result, and, in each, indications of β quinine, though to an unimportant extent.

The above quantity of water (seven ounces) readily dissolves 800 grains of sulphate of β quinine; and if 100 grains of this salt are dissolved in seven ounces of water, the crystals dried as above weigh only fifty-four grains, thus leaving forty-six grains in solution instead of about ten grains.

The medicinal effects of β quinine deserve investigation, the chemical constitution and the taste appear to indicate a great similarity if not identity.—*Lond. Pharm. Journ., May,* 1852.

ON THE ADULTERATIONS OF SULPHATE OF QUININE, AND THE MEANS OF DETECTION.

Mr. Zimmer, manufacturer of sulphate of quinine in Frankfort-on-the-Maine, has published the following circular and paper to his Correspondents abroad :—

Frankfort-on-the-Maine, Feb. 6th, 1852.

You are, doubtless, aware that various and partly spurious kinds of sulphate of quinine have for some time past found their way into the market. The substance now frequently mixed with quinine is quinidine. But little positive is yet known of the medicinal properties of this alkaloid, and whatever may be the result of future experiments, its arbitrary substitution is, under any circumstances, unwarrantable, and renders a fair and honest competition almost impossible.

The importance of the subject has induced me to address a few words to you, that I may submit a simple experiment by means of which the most usual adulterations of quinine may readily be detected. I have the honor to be, with much respect, &c.,

C. Zimmer.

The high price of the genuine Bolivian *Cinchona Calisaya*, through the monopoly of its export, has given occasion to imports, from other districts, of *Cinchonas*, the quality of which widely differs from that of the Calisaya, inasmuch as they contain principally quinidine. The lower prices of these barks, regardless of their different constituents, have brought them quickly into use in many manufactories of quinine, whereby a large quantity of quinine containing quinidine, has got into the market, causing an undue depreciation in the price of quinine.

The existence of this third chichona-alkaloid is now established without a doubt by ultimate analysis, by the peculiarity of its salts, and by important distinctive tests; and there can be no further question, that quinidine must, equally with cinchonine, be distinguished from quinine. The external characters of sulphate of quinidine differ from those of sulphate of quinine; it has a greater specific gravity and less flocculent crystallization. In dry warm air it parts with its water of crystallization, without deliquescing

or losing its crystallized aspect; lastly, it is far more soluble than sulphate of quinine in cold water and in alcohol.

One of the distinctive properties of the three alkaloids in question, *viz.*, their behaviour with ether—places in our hands a ready means of detecting the mixture of cinchonine and quinidine, with quinine. Schweitzer (*Lond. Med. Gazette*, vol. xxi., p. 175) has already employed ether for the detection of cinchonine with complete success, and his process has, with justice, been subsequently quoted in most manuals, as it answers its purpose completely; cinchonine is known to be entirely insoluble in ether, whatever may be the quantity of the ether employed. The solubility of quinidine in ether, as compared with that of quinine, is but slight: ten grains of pure sulphate of quinine dissolve in sixty drops of ether, and twenty drops of spirit of ammonia, while only one grain of sulphate of quinidine is soluble in the same quantity of the fluid; and in proportion, quinine containing quinidine will always be less soluble than pure sulphate of quinine.

Guided by this fact I can recommend the following simple and very convenient process for the detection of quinidine and cinchonine:—

Ten grains of the salt to be examined is to be put into a strong test tube, furnished with a tight-fitting cork; to this are to be added ten drops of diluted sulphuric acid (one acid and five water) with fifteen drops of water, and a gentle heat applied to accelerate the solution. This having been effected, and the solution entirely cooled, sixty drops of officinal sulphuric ether with twenty drops of spirits of ammonia, must be added, and the whole well shaken, while the top is closed by the thumb. The tube is then to be closely stopped and shaken gently from time to time, so that the bubbles of air may more readily enter the layer of ether.

If the salt examined be free from cinchonine and quinidine, or contain the latter in no greater proportion than ten per cent., it will be completely dissolved; while on the surface, where contact of the two layers of clear fluid takes place, the mechanical impurities only will be separated (in which respect the various sorts of commercial quinine differ.) After some time longer the layer of ether becomes hard and gelatinous, after which no further observation is possible.

From the above statement respecting the solubility of quinidine

in ether, it appears that the ten grains of the salt to be examined may contain one grain of quinidine, and still a complete solution with ether and ammonia may follow; but in this case the quinidine will shortly begin to crystallize in the layer of ether. The last trace of quinidine may be yet more definitively detected by employing, instead of the ordinary ether, some ether previously saturated with quinidine, by which means all of the quinidine contained in the quinine must remain undissolved. It is particularly requisite in performing this last experiment to observe, after the shaking, whether all has dissolved, for owing to the great tendency of quinidine to crystallization, it may become again separated in a crystalline form, and be a source of error.

If more than a tenth of quinidine or cinchonine be present, there will be found an insoluble precipitate at the limits of the two layers of fluids. If this be quinidine, it will be dissolved on the addition of proportionately more ether, while cinchonine will be unaffected.

It is expressly to be remarked, that the necessity for testing sulphate of quinine in search of other fraudulent adulterations is not superceded by the above described process.

We have particularly to determine upon the absence of inorganic substances, which may be effected by red heat on a platinum dish, or simply by solution in alcohol. Gypsum, chalk, magnesia, &c., will be left undissolved. Boracic acid will be dissolved by alcohol, but its green flame will indicate its presence in the alcoholic solution when ignited.

The absence of organic substances, such as salicine, sugar, stearic-acid, &c., may be inferred from the formation of a colorless solution with pure concentrated cold sulphuric acid: it is as well to leave the sulphuric acid to act for some hours.

The presence of sal-ammoniac may be detected by the addition of caustic potash to the suspected salt, when, if present, it will be known by the diffusion of the ammoniacal odor.—*London Pharm. Jour. March*, 1852.

Varieties.

Glycerin Paste.—We are indebted to Dr. Paul B. Goddard for the following recipe for making a very adhesive paste, suitable for fixing paper to glass and other surfaces, and which keeps well, viz:

Take of Gum arabic, an ounce.
" Boiling water, two fluid ounces.
" Glycerin, two fluid drachms.

Dissolve the gum in the water, add the glycerin, and strain if necessary.

On the Manufacture of Drying Linseed Oil without Heat. By Baron Liebig.—When linseed oil is carefully agitated with vinegar of lead (tribasic acetate of lead) and the mixture allowed to clear by settling, a copious white cloudy precipitate forms, containing oxide of lead, whilst the raw oil is converted into a drying oil of a pale straw color, forming an excellent varnish, which, when applied in thin layers, dries perfectly in twenty-four hours. It contains from four to five per cent. of oxide of lead in solution. The following proportions appear to be the most advantageous for its preparation:

In a bottle containing four and a half pints of rain water, eighteen ounces of neutral acetate of lead are placed, and when the solution is complete, eighteen ounces of litharge in a very fine powder are added; the whole is then allowed to stand in a moderately warm place, frequently agitating it to assist the solution of the litharge. This solution may be considered as complete when no more small scales are apparent. The deposit of a shining white color (sexbasic acetate of lead) may be separated by filtration. This couversion of the neutral acetate of lead into vinegar of lead, by means of litharge and water, is effected in about a quarter of an hour if the mixture be heated to ebullition, When heat is not applied, the process will usually take three or four days. The solution of vinegar of lead, or tribasic acetate of lead thus formed, is sufficient for the preparation of twenty-two pounds of drying oil. For this purpose, the solution is diluted with an equal volume of rain water, and to it is gradually added, with constant agitation, twenty-two pounds of oil, with which eighteen ounces of litharge have previously been mixed.

When the points of contact between the lead solution and the oil have been frequently renewed by agitation of the mixture three or four times a

day, and the mixture allowed to settle in a warm place, the limped straw-colored oil rises to the surface, leaving a copious white deposit. The watery solution, rendered clear by filtration, contains intact all the acetate of lead at first employed, and may be used in the next operation, after the addition to it as before, of eighteen ounces of litharge.

By filtration through paper or cotton, the oil may be obtained as limpid as water, and by exposure to the light of the sun it may also be bleached.

Should a drying oil be required absolutely free from lead, it may be obtained by the addition of dilute sulphuric acid to the above, when, on being allowed to stand, a deposit of sulphate of lead will take place, and the clear oil may be obtained free from all trace of lead.—*London Pharm. Journ.* April, 1852.

On the State in which Oxygen exists in the Blood. By Baron Liebig.—According to the opinions of some Chemists oxygen is not chemically combined with, but is merely absorbed by, the blood, and in proof of this opinion the fact is cited that the absorbed oxygen can be expelled by carbonic acid. This inference is, however, according to the author, incorrect, and for the following reasons:—1000 volumes of water shaken with air and completely saturated therewith, absorb, according to Gay Lussac, only $9\frac{1}{4}$ volumes of oxygen and $18\frac{1}{2}$ volumes of nitrogen gas, while, according to the experiments of Magnus, 1000 volumes of blood will appropriate from 100 to 130 volumes of oxygen, and from 17 to 33 volumes of nitrogen. If the absorbed oxygen be contained only in one part of that fluid, that must be its water, which it is known under the same conditions absorbs from 11 to 14 times less oygen; the greater activity of its absorption by blood must be owing to some definite element which has a stronger affinity for oxygen than water possesses.

If the attractive power which the blood exercises towards oxygen be but slight, it does not thence follow that it is not chemically united. On the contrary, it is well known that the presence of one per cent. of phosphate of soda in water doubles its power of absorbing carbonic acid, over that of pure water at the ordinary atmospheric pressure. Solution of sulphate of iron will absorb forty times as much nitrogen as pure water can. Both of these solutions lose their gaseous contents in a vacuum, the former also by agitation with air, the latter by shaking with carbonic acid. It is hence obvious, and the conclusion applies to the blood, that absorption is greater in water holding salts in solution than in water alone.

A fluid then may be in two conditions, on either of which its absorbent power over gases may be dependent, viz., under pressure which condenses the gas, or chemical affinity exerted by its elements upon the gas.

If the oxygen of the blood were simply absorbed, then it must take up from the air, which contains only one-fifth of oxygen, twelve per cent. of

oxygen; double that proportion under twice the ordinary pressure; treble, under three-fold pressure; and if shaken with pure oxygen, it must receive five times as much. It has not yet been proved that the absorbent power of the blood varies with the alteration of atmospheric pressure. The researches of Regnault and Reiset have demonstrated that in the neighborhood of the Lake of Titicaco, in Puno (South Peru,) 12,000 feet above the sea, 15,000 persons—and at Potosi, in Bolivia, at a height of 12,600 feet, 30,000 persons live and breathe as well as those who reside on the sea-shore. Now, if the oxygen were merely absorbed by the blood, considerable influence must be exercised by the great differences in the amount of oxygen taken up.—*Ibid*, from *Chimisch-Pharmaceutisches*, *Central-Blatt*, December, 1851.

Adulteration of Borax.—We understand that there is at the present time in the market a quantity of adulterated borax, sold by a house at Wolverhampton, to which we thinkit right to call the attention of the trade. It contains twenty per cent. of *phosphate of soda*, which may be separated by exposing the sample to the heat of a drying-room for a few hours, when the phosphate effloresces and may be *picked* out—amounting to one-fifth of the whole. As a corroborative proof, solution of nitrate of silver may be added to a very dilute solution of 150 grains of the adulterated article, and then from the precipitated phosphate of silver the phosphate of soda may be calculated, which will equal 19·5 grains. This test is not perfectly accurate on several accounts, but affords a near approximation.—*Ibid.*

On the Scherbets of the East. By Dr. Landerer.—As the prohibition of wine imposed upon Mahommedans by the Koran, has induced the use of opium as a means of producing intoxication, so it may have probably been the cause of the invention of those beverages so generally employed in the East, *Scherbet* and *Bosa*.

The Eastern scherbets usually consist of water in which jelly or syrup made from fruit have been dissolved, or of an infusion in water of the fruit itself; and their composition varies according to the facility with which any fruit can be obtained. In Egypt, a scherbet is prepared from the roots of *Cyperus esculentus*, which are brought to Cairo and Alexandria in considerable abundance, and sold in the bazaars combined with rice, in the form of cakes. The Egyptians also use a scherbet made with honey. Various ingredients, as vanilla, otto of rose, peppermint, vinegar, and even mastich, are used to impart a flavor to scherbet, while an agreeable color is obtained by the employment of cochineal, the juice of the berries of *Phytolacca decandra* or of *cornus mas*, the latter an esteemed fruit in Asia Minor. One of the chief requisites for the scherbet is *cold* water, which, in the absence of ice, is obtained by the use of a porous earthen vessel, like the unglazed water-bottle or Alcarraza of the Spaniards.

The beverage called *Bosa* is a sort of acidulated, and sometimes fermented, scherbet. In its commonest form, it is made by fermenting an infusion of millet seed, and in this state probably represents the barley-wine, Οινος κριθης of the ancients. A more agreeable Bosa is prepared by the Egyptians from tamarinds and honey, and by the Greeks from the fruit of the love-apple (*Solanum Lycopersicum*) the latter beverage being called Δροσιστικον.

The manufacture of these drinks gives employment to a vast number of persons called *Scherbetzides*, the peculiar sound of whose little bells, struck by a machine, which at the same time cools their glasses by a stream of water, may be heard far and near through the streets of an eastern town, inviting customers to their trays, on which syrups, fruit, and sweetmeats are displayed.—*Lon. Pharm. Journ.*, March, 1852.

On Spurious Rhatany Root. By Prof. METTENHEIMER, of Giessen.—The root of the *Krameria triandra, R.* and *P.*, is one of the exotic drugs, which, generally speaking, is but seldom adulterated. Once lately, the author has found it adulterated by the *Radix Calagulæ*, an underground root of the Polypodium, growing in Peru, and seldom met with in the German trade. It differs both in chemical and physical characters from rhatany root. The root of the *Krameria Ixinia*, L., more closely resembles, and has more frequently been substituted for the genuine rhatany. During the year the author has several times met with spurious rhatany root, the source of which is altogether unknown to him. It has generally a thickness of one or two inches, and a length of four inches in its principal pieces, or of twelve inches in the secondary twigs, the average being about half an inch in thickness. Compared with the true rhatany, its twigs are smoother and slightly shining, having also deeper furrows and transverse depressions, of an annular form. It has, moreover, as sometimes seen on the true rhatany, wart-like projections, and the twigs and stems have a somewhat undulatory contour. The false rhatany is not so tough, and breaks more easily, with a short fracture. When viewed in bulk, it has a dirty violet red-brown color. Its bark is thicker and more firmly adherent to the wood; on its inner surface, the bark is lighter colored, and, when cut with a sharp knife, has a glistening aspect. The centre, when cut through, is of a dull, pale-red color, and without the dark points generally met with in true rhatany root. The false root has no odour; its taste is more strongly astringent than rhatany root. With chemical reagents, the false root gives generally more abundant precipitates than the true root.—*Ibid*, from *Jahrbuch fur praktische Pharmacie*, Oct., and Nov., 1851.

Cork Stoppers with Wooden Tops.—Dr. PEREIRA called the attention of the Members of the Pharmaceutical Society to the very convenient com-

pound stoppers in use in Germany and other places. His attention had been especially drawn to them, partly in consequence of having recently received several pharmaceutical substances from Germany, contained in bottles closed with these stoppers; and partly in consequence of having observed that many of the vegetable and other substances, sent from British Guiana to the Great Exhibition (most of which have been presented to the Pharmaceutical Society,) were preserved in bottles closed by this kind of stopper.

These stoppers consist of an accurately turned cork, or bung, surmounted by a flat wooden disk, or top, glued to it. This top is either round or polygonal; and may be either colored or covered by paper. It projects beyond the circumference of the cork, and serves as a handle. Its upper surface being flat, is useful for inscribing either the name of the article contained in the bottle; or, when the bottle is used in dispensing, the directions for the use of the medicine.

These stoppers are very convenient for closing bottles and jars used in museums, for preserving dry objects of natural history; as fruits, seeds, leaves, &c. They are much lighter than glass stoppers, and are not liable to get fixed, as they may be removed with the greatest facility. Moreover, bottles closed by them may be placed sideways in a drawer, without incurring the danger of the stoppers falling out.

To the Pharmaceutist, they cannot but be useful and convenient, for the preservation of powders and other dry substances; as well also for dispensing. Small bottles, closed with these stoppers, may be employed as substitutes for pill-boxes.—*London Pharm. Journ.*, Jan. 1852.

Disinfecting Property of Chloroform.—Dr. AUGUNA, of Constantinople, in a Memoir (sopra una nuova proprieta del chloroformio,) establishes the excellence of chloroform as a disinfecting agent, and shows, by reference to some highly interesting experiments, how this, its newly discovered virtue, distinguishes chloroform from the older anæsthetic sulphuric ether. Taking three wide-mouthed and thoroughly clean bottles, Dr. Auguna placed in one a small quantity of chloroform, and in another a small quantity of sulphuric ether; while into both he introduced a piece of the muscle of an ox. The muscle was placed in the third bottle, but no fluid was added; the three were then accurately closed. It was soon observed that the color of the flesh in the bottle containing chloroform changed from a deep red, its original hue, to a vermilion shade, but that the muscle in the bottle containing ether remained unchanged. At the termination of a week, the effect was still more clearly displayed; while the flesh in the bottle of air remained unaltered, that in contact with the chloroform had assumed the appearance of cooked meat. Upon opening the bottles, the flesh in the ether, and that in the air, exhaled a most offensive odor, and was itself far advanced in putrefaction. Not so that preserved in chloro-

form; it remained still undecayed, and possessed no smell save that peculiar to this fluid. It is not only over flesh, but over fruits and seeds, that Dr. Auguna has found chloroform to possess an antiseptic property. Dr. Auguna estimates that 1-200th of chloroform is sufficient to oppose the putrefaction of a piece of fresh muscular fibre.—*Boston Medical and Surgical Journal*, from *Gazetta Medica Italiana.*

Jatropha Urens.—The most deadly plant ever possessed at Kew, the jatropha urens, is no longer to be found there; it has either been killed off like a mad dog, or starved to death in isolation like a leper. Its possession nearly cost one valuable life, that of Mr. Smith, the present respected curator. Some five and twenty years ago, he was reaching over the jatropha, when its fine bristly stings touched his wrist. The first sensation was a numbness and swelling of the lips; the action of the poison was on the heart; circulation was stopped, and Mr. Smith soon fell, unconscious; the last thing he remembered being cries of "Run for the doctor." Either the doctor was skilful, or the dose of poison injected not quite, though nearly enough; but afterwards the man in whose house it was, got it shoved up in a corner, and would not come within arm's length of it. He watered the diabolical plant with an indefinitely long spout. If the vase itself contained a *quid pro quo*, he is not to be greatly blamed. Another not much less fearful species of *jatropha* has appeared at Kew and *disappeared.*—*Amer. Jour. of Med. Science*, April, 1852, from *Kew Gardens Quarterly Review*, December, 1851.

Elimination of Poisons.—M. F. ORFILA, the professor's nephew, has read a paper before the Academy of Sciences of Paris, on the above subject. He states that a great number of poisons, after being absorbed, mix with the products of the various secretions, as urine, perspiration, saliva, gastro-intestinal fluids. All poisons do not pass into these secretions, but the majority of them may be discovered in the urine. It is rather a remarkable fact that arsenic and iodine do not pass into the bile. These are the only substances which have hitherto been sought in that secretion; it is, however, probable, that the same results will be obtained when other poisons are thus tried. Noxious principles are gradually expelled from the body in the manner above described—some in a short time, as arsenic and mercury; but others may be detected in the substance of the viscera, four, five, and even eight months after their introduction. The more the urine carries off a poison, the sooner will the latter be expelled from the economy. Arsenic and mercury pass into the urine so early as the seventh day after their introduction into the system, and they are quite expelled in a few days. Lead and copper are not detected in the urine, and the entire expulsion of these metals does not take place for eight months.

When a poison is absorbed, very good services may be rendered by the use of diuretics, purgatives, and diaphoretics. Still, a poison may be lodged in the economy, without our being able to suspect the fact by the analysis of the urine. As that portion of the poison which has been absorbed gradually decreases up to a certain period, it is quite impossible, and even absurd, to attempt calculating the amount of the poison which has been administered, by the quantity found in the viscera, putting other sources of error out of the question, such as vomiting, loss during experiments, &c.

It is an error to suppose that, because a poison remains a long time in the system, it will continue so for an indefinite period, for which nitrate of silver is administered to dogs; the metal may be found in the liver five months afterwards, but not after seven months. It must be supposed that the mercury, lodging so long in the viscera, becomes in some degree *tolerated* there. M. F. Orfila believes, with his uncle, that antidotes may do much good, and neutralize the action of certain poisons, even when the latter have already passed into the blood, the liver, spleen, &c., both by forming less poisonous compounds, and by giving rise to certain combinations, which are more easily eliminated.—*Med. News.*

Mr. Faraday.—He who is universally acknowledged to be the first chemist in the world—the pride of science and the especial boast of England—Michael Faraday, was born in 1794. He was the son of a blacksmith who bound him to a bookbinder in London, with whom he served out an apprenticeship till he was twenty-one years of age. He had no other education than what he secured by indomitable perseverance under the most trying and mortifying circumstances. Having had the luck to hear a lecture by Sir Humphrey Davy, a ticket of admission having been presented to him for the evening, an instantaneous conviction of his own inherent powers seems to have flashed before his mind. He made the acquaintance of Sir Humphrey, and afterwards became his assistant, secretary, friend, and finally his successor. It is well known that Sir Humphrey, in speaking of his own achievements in science, said that his greatest discovery was made when he found Michael Faraday. We have been present at the Royal Institution when the very aisles were filled with peers of the realm, standing for want of seats to listen to the learning and wit of this model lecturer. He is the first and only chemist we ever heard who made the science irresistibly fascinating. The charm is in his natural simplicity—for he is not graceful—his colloquial freedom, and unexpected and playful sayings, which prevent any tendency to weariness in the audience, combined with a kind and winning manner of address. Mr. Faraday puts on no airs, and has the good sense to treat everybody with marked politeness. In raising himself to distinguished fame, he has retained every former personal friendship, and he is still always accessible

to the people. In lecturing, he never had a note before him when we have been present, nor did his lectures appear to have been very methodically arranged. To what height might chemistry rise in the medical schools of this country, if those who teach it possessed the energy, enthusiasm, sprightliness, learning and suavity, that distinguish the leading chemist of England.—*Boston Med. and Surg. Journal.*

Charcoal Cushions for Deodorization.—A. S———, a patient under my care in the Hackney Union Infirmary, has for some time "passed every thing under her," and thereby become a nuisance and cause of complaint to the other patients in the ward. Eleven days ago, I adopted the plan of placing beneath her a calico bag two feet square, partly filled with Irish peat-charcoal, so as to form a sort of a cushion and absorbing medium. It has had the happy effect—which continues even now, without any necessity for changing the charcoal—of completely neutralizing all unpleasant odor; and if the bed becomes partly wet all the offensive ingredients are absorbed and neutralized by the charcoal, which thus is a most simple means of remedying a great nuisance, and one that requires the most strict attention at best to prevent; and that attention is often difficult and always expensive to procure. In cases of incontinence of urine particularly, and indeed all attended with fœtid discharges, cancer, compound fractures, &c., this plan, or some modification of it, might be adopted with advantage. I have been informed that some of the same material has been placed in the urinals of the South-Western Railway, with equally good results, in the prevention of unpleasant odor; and that even after it had been unchanged for some weeks, the fluid that percolates has been found, by chemical analysis, to contain little or no trace of the organic or saline products of urine. The fact induced me to try it as above. An argument in favor of its adoption in hospitals and lunatic asylums is, that the peat, after its deodorizing properties are exhausted, becomes more valuable for the purpose of manure, so that its use is without expense.—*Boston Medical and Surgical Journal,* April 1852, *from Mr. Howell, in London Lancet and Dublin Medical Press.*

On the Composition of Cocoa-Nut Juice. By WILHELM M. LOEWENICH, of Erlangen.—In 1000 parts of this cocoa-nut liquid, I found,

Water	900.88
Sugar	4.43
Gum	17,67
Extractive matters (fat)	28.29
Salts soluble in spirits of wine	5.44
Salts not soluble in spirits of wine	6.29
	100.0000

Of the individual salts I only determined the acids quantitatively, as the material was not enough to do the same with the bases. In 1000 parts I found,

Hydrochloric compounds . .	1.708
Phosphoric compounds .	1.633
Sulphuric acid compounds . .	2.29

Poisoning by Oleum Gaultheriæ. By Thomas J. Gallaher, M. D., of Pittsburg, Penn.—[In the Medical Examiner for June 1852, we find the details of a case of poisoning, where a child nine years of age swallowed, as near as could be ascertained, about half an ounce of the oil of winter-green, from which he recovered by treatment. We received it too late to be noticed at page 210. The concluding remarks of Dr. Gallaher are extracted for the benefit of our readers.—Editor.]

Remarks.—The principal object in reporting this case is to record the effects of the Oleum Gaultheriæ upon the human subject, when given in an over dose. But few instances of poisoning from this article are on record, and these are not accurately described, therefore the medicinal and toxicological properties of it are but imperfectly known. Writers describing gaultheria attribute to it only aromatic and slightly astringent properties. Instances are mentioned of death from its use in large doses, from its causing inflammation of the stomach.

The case above described clearly shows that this plant, or at least its essential oil, possesses more properties than are usually attributed to it. The peculiar symptoms which are produced by its specific action in this instance, were, 1st, great dulness of hearing, without a general disturbance of the cerebral functions; 2, a slow, laborious and loud respiration, not stertorous; 3, a most voracious appetite for food, accompanied by symptoms which indicated gastro-enteric inflammation. These symptoms plainly indicate that Oleum Gaultheriæ acts as a direct and powerful sedative, when given in an overdose, upon those nervous centres which govern the functions of hearing and respiration; and that it is a powerful irritant to the gastro-enteric mucous membrane, with which it comes in contact, lighting up in it intense inflammation, which inflammation was accompanied by a peculiarly morbid condition of the gastric nerves, as evidenced from the great appetite with which it is attended. It does not appear to exert any specific influence over the cerebro-spinal centres generally, but only upon a few situated in the medulla oblongata.

The Union Medicale states that 1812 there were 537 medical men practising in Paris, whilst in 1851 there were 1,352, being an augmentation of 815 in forty years. The population of Paris in 1812 was 547,756 inhabitants, or 1,018 persons for each medical man; at present it is 900,000, or 666 for each medical practitioner.—*Ibid.*

Analysis of Bedford [Pennsylvania] Spring Water.—By J. CHESTON MORRIS.—One pint of the water evaporated at 240° F., yields of solid residuum . . . . . grs. 22.201

CaO, CO_2	Carbonate of Lime	2.120	
CaO, SO_3	Sulphate of Lime	11.274	
MgO, So_3	Sulphate of Magnesia	3.974	
$(Al_2 O_3 + Fe_2 O_3) SO_3$	Sulphates of Alumina and Iron	1.280	
NaO, SO_3	Sulphate of Soda	3.092	
$NaCl$	Chloride of Sodium	0.343	
SO_3	Free Sulphuric Acid	0.128	
SiO_3 &c.	Organic matter and Silica	*trace*	22.201

"In the estimation of the iron as a persulphate, there is probably an error, which would, if corrected, increase slightly the amount of free sulphuric acid. The quantity of iron and alumina is so small as to render it almost impossible to separate them correctly."*

Medical Examiner, June 1852.

The Voltaic Pile.—The President of the French Republic has published a decree offering a reward of 50,000 francs (2,000*l.*) to such persons as shall render the voltaic pile applicable with economy to manufactures, as a source of heat, or to lighting, or chemistry, or mechanics, or to practical medicine. Persons of all nations may compete for this prize, and the competition is to be open for five years.—*Ibid.*

On the Hydrated Peroxide of Iron and Magnesia as Antidotes in poisoning with Arsenic. By J. HAIDLEN.—The author has satisfied himself by experiments, that to completely precipitate 1 part of arsenious acid within five minutes by hydrated oxide of iron, 22 parts of the latter are required. Some which had been kept for a year had lost more than two-thirds of its power; in another case it had lost one-third of it. As it is well known on account of this property of the hydrated oxide of iron, Fuchs has recommended the mixture of a solution of persulphate of iron, which yields from 17 to 18 per cent. of the hydrated peroxide dried at 212° F., with excess of caustic magnesia. In the Wurtemberg Pharmacopœia the mixture of perchloride of iron with excess of magnesia is prescribed. The author finds that both mixtures precipitate the arsenious acid equally as well as the pure hydrated peroxide of iron, so that there is no chemical objection to their use.—*Chem. Gaz.*, May 1852, from *Jahrb. fur Prakt. Pharm.*, vol xxiii. pp. 196.

*Can sulphuric acid exist in a free state in the presence of an excess of carbonate of lime?

Minutes of the College.

At a stated meeting of the Philadelphia College of Pharmacy, held 3d month 29th, 1842.

Since the last stated meeting, the Board of Trustees have elected Joseph B. McMackin, William W. D. Livermore, Caleb R. Keeney, Thomas S. Wiegand, Charles S. Braddock and Evan T. Ellis, members. By their minutes the College was also informed that a Public Commencement had been held, and the Degree of Graduate in Pharmacy had been conferred upon the Graduates of the Institution, whose names were published in the last number of the Journal.

The Delegates appointed to represent the College in the Convention held at New York, on the subject of establishing uniform standards for imported drugs and medicines, by which their admission should be regulated alike in all parts of the United States, reported they had attended at the time proposed, and participated in the proceedings of the Convention.

The following Report of the Publishing Committee, accompanied by the statement of the Treasurer was read:

To the Philadelphia College of Pharmacy.

"The Publishing Committee respectfully report,

That the Journal has been issued regularly since last report. A more general interest appears to be gradually awakening, manifested by an increased subscription list, and by the number of communications from distant contributors.

The suggestions brought forward in the last report relative to an increase of matter, have been carried out, so that each number embraces one-fourth more than formerly, in the same number of pages.

Notwithstanding this enlargement of volume, it is the opinion of many that the price charged for the work is greater than is usual for such periodicals, when its quarterly issue has been taken into consideration, and it has been hinted on several occasions that the work should appear at shorter intervals.

These, and other suggestions which have been made from time to time, have not been lost on the Committee and Editor, who desire to act in the matter in the way best adapted to advance the object for which the Journal was established, as well as to keep its finances in the healthy condition they now present.

Should any change be determined on by the Committee, it will probably have reference to the ensuing year, and the increased expenditure consequent thereon will have to be considered in any disposition that may be proposed in reference to the Balance in the hands of the Committee."

The Committee appointed by the Board of Trustees to bring forward names to represent the College in the National Convention reported several names. Charles Ellis, Daniel B. Smith and William Procter, Jr., having received a majority of votes, were declared duly elected as delegates to the Convention to be held in this city.

Being the time for holding the annual election, the following named members were duly elected to the respective offices:

President—Daniel B. Smith.
1st Vice-President—Charles Ellis.
2d Vice-President—Samuel F. Troth.
Secretary—Dillwyn Parrish.
Treasurer—Ambrose Smith.
Corresponding Secretary—Joseph C. Turnpenny.

Publishing Committee.

Prof. Robert Bridges, Charles Ellis,
Edward Parrish, William Procter, Jr.
Alfred B. Taylor.

Trustees.

Warder Morris, William Procter, Jr.
Robert Bridges, John H. Ecky,
Edward Parrish, William P. Troth,
Daniel S. Jones, Caleb H. Needles.

Committee on Sinking Fund.

Warder Morris, Samuel F. Troth,
Ambrose Smith.

Then adjourned.

Dillwyn Parrish, Secretary.

Editorial Department.

Pharmaceutical Convention of 1852.—We have received several communications from gentlemen residing in towns where no organization exists among the apothecaries, who feel a strong interest in the approaching Convention, asking whether, from not being members of pharmaceutical societies, they are ineligible to attend the Convention. It is gratifying to find our brethren at a distance awakening to this subject. Individuals who will come a long distance to attend the sittings of such a body, actuated by a feeling of interest in its objects, can hardly fail to prove useful members, and should be admitted, in our opinion, to seats, and to partake in its deliberations, if not in its decisions. When it is considered that the Convention of last year was called for a special object, whilst that called for October next has reference to the interests of the whole profession, we cannot but view the intended gathering as an initiatory movement—as a general call with a view to future organization—rather than as an adjourned meeting of an organized body, adapted in its constitution to the object it is intended to effect. Hence it would have been wise to have given a general call to pharmaceutists throughout the United States to meet, and, after organizing, determine on the future sources of its delegates. If that Convention should be but the commencement of a national association, as we believe, its healthy continuance will require it to be constituted of regular delegates having credentials from pre-determined authorities. If this be admitted, from whom shall the delegates come? If they are to be confined to permanent local societies, the larger part of the apothecaries of the country would be unrepresented. With due deference to a better plan, we would suggest that any *ten* established apothecaries and druggists, located in one place or neighborhood, where *no organization exists*, should be entitled to send a delegate to the Convention. This course would give a degree of authority to such delegates, who, coming directly from the pharmaceutical ranks, could speak for their brethren at home. In places where organized societies are in existence, such societies should be empowered, if they desire it, to send a number of delegates proportioned to the number of apothecaries and druggists where they are located. Towns not numbering ten apothecaries should have the right to send a representative. This course would give a more liberal and republican character to the Association, and not confine its members to cities or institutions. Meanwhile,

we hope that *every* pharmaceutist, whose sympathies attract him toward the Convention, will come, as there is every reason to believe that, on the first sitting of the delegates, measures will be taken to extend to them a participancy in its deliberations, if not in its decisions.

It has been repeatedly asked, what will the proposed Convention find to do? Will it be a mere formal organization without vitality, or a feasible object to accomplish, which will pass resolutions, publish them, and then disperse, satisfied that the profession will be improved and elevated? We trust that no such useless and unworthy results will be pointed to hereafter as the best fruits of the Convention of 1852. It is action, not talking, that is wanted; it is wisdom, not eloquence, that is needed; it is conscientious pursuit of the general good, not individual ambition, that is desired; and it is a generous sacrifice of knowledge and influence by the better educated and successful, on behalf of those whose want of qualifications and success arises more from the force of circumstances, than from disinclination to improve their practice.

Among the subjects which merit the action of the Convention, a few will be noticed: 1st, The plan of local organization best calculated to subserve the interest of those concerned; 2d, Pharmaceutical education as it relates to the studies pursued, the manner of teaching, and the practice of the shop; together with a consideration of the means most effectual for encouraging ill-qualified established apothecaries to improve their practice.

3d, The Convention, viewing itself in the light of a scientific association, might receive written communications of scientific or industrial interest connected with pharmacy, and, if worthy, direct them, to be published in its transactions. In this connexion, it would be desirable that members should bring every offering worthy of a notice, whether in the form of draughts or models of apparatus; practical suggestions in manipulation, or criticisms on processes; specimens of, or information relating to the natural productions available in our art; and lastly, sketches of the state of pharmacy among their constituents.

4th, With a view to more efficient action than could be effected in a Convention, standing committees might be appointed, to whom subjects should be committed for investigation during the recess, previous to the next annual meeting. These committees might be entrusted with such subjects as the following, viz: 1st, What are the *actual* results of the law against adulterated drugs, chemicals and medicinal preparations, based on an examination of the custom house records as compared with the drugs on sale. 2d, To what extent is home adulteration practised, where is it most practised, and what suggestions can be made to lessen or prevent it? 3d, What is the actual practice and customs of the apothecaries generally throughout the Union in relation to the employment of the formulæ of the United States Pharmacopœia in making their preparations? 4th, To what

extent the practice of medicine and pharmacy are united in the same individual, in places having more than two thousand inhabitants.

5th, Other committees of qualified individuals, might be entrusted with more special subjects for investigation, as, for instance, 1st, what are the causes which occasion the decomposition of syrups, and what means can be suggested to increase their permanence? 2d, What form of evaporating apparatus, adapted to the limited demand of the apothecary, is best calculated by its simplicity of construction, cheapness and durability, to meet his wants? 3d, Whether is it better, in making hydro-alcoholic extracts, to employ alcohol and water consecutively, or mixed in the form of diluted alcohol, deciding the question by the activity of the resulting product, as ascertained by chemical analysis, if the active constituent is well defined, or by therapeutic trials if it is not? 4, In the process of displacement or percolation as applied to the extraction of drugs, what is the degree of exhaustion which should determine the conclusion of the process, (when the quantity of product is not necessarily pre-determined, as in tinctures, wines, etc.,) in view of the effects or expense of evaporation? 5, What is the best arrangement for filtering fixed oils, combining simplicity of construction with effectiveness of action? 6th, What is the degree or amount of the deteriorating action of light on the fixed and volatile oils, tinctures and wines, when kept properly closed, and whether it would not be better to protect these substances, or some of them, from the influence of light in our shops?

Chemistry, of all the sciences, is that most closely connected with pharmacy, and most worthy of the attention of its practitioners. The many able individuals that now grace our profession should bring some of the fruits of their chemical observations, irrespective of their application to pharmacy, that a taste for this noble pursuit may be encouraged.

Such a course would, in a few years, render the meetings of the *American Association of Pharmaceutists* seasons of rich intellectual enjoyment to those who participated, and greatly advantageous to those at home, from the many useful and interesting memoirs that would scarcely fail to emanate from a body so organized.

The prospective adoption of a code of ethics should be considered, and the preliminary steps taken to digest and mature it. Any action of the Convention in this direction cannot be too cautiously and carefully taken, in view of the crippled condition of druggists and pharmaceutists as a body, in reference to quackery, directly or abettingly; as well as to the great want of uniformity that exists in shop practice. The association should aim at reformation in these respects, and especially by a thorough and faithful adoption of our National Pharmacopœia as the rule of practice. Deep rooted evils in a profession can rarely be removed by sweeping legislation, unless the measures are enforced by despotic power. Let the well disposed among us, therefore, show practically the working of a higher standard,

as an example to those not now willing or able to adopt it, which will be more influential than volumes of precepts.

WORKS OF THE CAVENDISH SOCIETY.

Handbook of Chemistry. By LEOPOLD GMELIN, Professor of Chemistry in in the University of Heidelberg, &c. Six volumes octavo. Translated by HENRY WATTS, B. A., F. C. S., Assistant in the Birkbeck laboratory, University College, London. 1848–49–50–51.

The "Handbook of Chemistry" has long enjoyed a high reputation in Germany, where its author, the veteran Chemist, Privy Counsellor Leopold Gmelin, announced his intention of issuing the first volume of a fourth edition in 1843. The long interval of fifteen years that had elapsed since the previous edition, rendered a revision of the work highly necessary in order to incorporate the very numerous discoveries and improvements introduced into the science since that time. The author observes, "I have studied in the present edition, still more than in the preceding, to incorporate into a systematic whole every fact which appears to be worthy of confidence, carefully referring it to its first observer, or source, as completely as I could compatible with due brevity. Thus the work may serve not only to communicate fundamental instruction in the chemistry of the present day, but to indicate the original store-house from which I have made my selection, so that others may be guided directly to the spot. I have also sought to render this edition more generally useful than the previous one, by embracing in its details a fuller exposition of the most important subjects of pharmaceutical, technical, and analytical Chemistry.*

As the "Handbook" gradually evolved from the German press, occasional extracts and reviews in the English Journals directed the attention of those not familiar with the language of the author to it, and when it was announced that the work was to be translated and published under the auspices of the Cavendish Society, much satisfaction was evinced by the increased number of subscribers to that useful Association.

Thus far, only the inorganic part of the Handbook has been translated and published, comprised in six octavo volumes; and a large number of English chemical readers have had an opportunity of examining the book, and can testify to its great comprehensiveness.

To give a review, or even an analysis of the "Handbook," such as it deserves, is not our object: *space* and *time*, and perhaps inability, will prevent it, but the following is a scattered outline of the groups of subjects:—The *first* volume commences with an introductory chapter which includes a short outline of chemical progress in the modern era of history, followed by a full exposition of cohesion, crystallization and adhesion.

*Pharm. Journ., vol. iii., page 84.

Part I. The Philosophy of Chemistry; affinity treated under the following heads, viz: 1, fundamental notion of affinity; 2, range of affinity: 3, formation of chemical compounds; 4, decomposition of chemical compounds; 5, strength of chemical affinity; 6, origin and nature of the phenomena of affinity.

Part II. Special Chemistry; 1, the chemistry of the imponderables, light, heat and electricity, with which the first volume concludes.

The *second* volume discusses the non-metallic elements and their mutual compounds. The *third, fourth, fifth* and *sixth* volumes are occupied with the metals and their compounds with each other, and with the non-metallic bodies. The metallic salts of all kinds, which, from their great number, are, to a large extent, passed over in all the ordinary treatises, have received due attention; and this feature will prove exceedingly useful to pharmaceutists who often need information on that class of substances.

In the discussion of a subject, the various authorities, whether separate works or isolated papers in the journals, are placed in a list at the head of the chapter, by which investigators are at once refered to the spring sources whence the author derived his information. Its history is then succinctly given; then the natural sources of the substance; and lastly, its preparation, properties, affinities, &c. The author brings all the facts worthy of credence to bear on his subject with a discrimination and industry as wonderful as it proves useful.

The translation and preparation of the "Handbook" for the press was entrusted by the Cavendish Society to Mr. Henry Watts. The most extensive additions by the translator will be found in the first volume, which had been longest published, and embraced so many important subjects in the higher range of chemico-physical inquiries which of late years have been pursued with much success by Faraday, Regnault and others, as "the relation between atomic weight and density, the relation of light to magnetism, the calotype process, thermography, radiation and conduction of heat, expansion, specific heat of liquids and vapors, tension of vapors, liquefaction and solidification of gases, development of heat in chemical combination, decomposition of water by heat, development of electricity during the escape of high pressure steam, voltaic batteries, and the magnetic condition of all matter."

The organic part will be commenced this year, and will, when completed, be by far the most comprehensive treatise on this branch of chemistry extant. A review of this part of the German edition (Pharm. Journ., vol. vi., page 550,) says: "We are fully persuaded that no such philosophical digest of chemical science, in its most intricate and interesting department, has ever before been presented to the world. It is, in fact, one of the noblest monuments of industry, sagacity and candor, ever produced by one mind. By completing his Handbook in this same admirable manner, the

amiable and accomplished author will earn the lasting gratitude of every student and lover of chemistry.

"On surveying the preceding portions of this great chemical treasury, Baron Liebig was induced to address the publisher in the following eulogistic and well merited language: 'The industry, the conscientiousness, the carefulness and patience of the author excite the utmost astonishment. I do not believe that any other nation can exhibit a work which can be placed on a par with Gmelin's, or a man who combines such a vast compass of knowledge with the spirit and power to execute so colossal a labor.'"

The great size of the work prevented the publishers from taking hold of it, and, in presenting it to the English chemical reader, the Cavendish Society has conferred a valuable benefit.

Physiological Chemistry. By Prof. C. G. Lehmann. Vol. I. Translated from the 2d edition by George E. Day, M. D., F. R. S. London, 1851. Printed for the Cavendish Society, 1848-9 50-51.

This volume is the first of the publications issued by the Cavendish Society for the year 1851. The author has long been favorably known as a physiological chemist, and his book ranks high among the chemical literature of Germany. The translation of Dr. Day is made from the recent German edition. The work begins with a *methodological* introduction, wherein the present condition of physiological chemistry and the systems of its cultivators are discussed. The author, in entering upon his subject, endeavors to point out some of the numerous errors into which the most zealous elucidators of the chemistry of physiology have been led, which appear to him to have diverged in three directions:

"In the first place, too little attention has been directed to the laws of a true natural philosophy, whose simplest rules have in many cases been wholly disregarded; in the next place, the necessary casual connection existing between chemistry and physiology, as well as between histology and pathological anatomy, has too often been entirely neglected; and lastly, much misconception has arisen from the assumption that chemistry afforded a satisfactory solution to many questions which it is either wholly incompetent to answer, or which must, at all events, remain undecided in the present state of our knowledge," page 2.

Acknowledging that the use of hypotheses are indispensable in the prosecution of physical inquiries, he censures the custom too often exhibited of seizing on a few facts as the basis of a theory of the merest fiction, and says:

"Physiological chemistry has given rise to many delusions of this nature, owing to its imperfect development and to the necessity presented by physiology and pathology for chemical elucidation. Some few isolated deductions were drawn from superficial chemical experiments, and arranged in a purely imaginary connection by the aid of chemical symbols and formulæ, for whose establishment analysis in many cases did not even afford any sanc-

tion. Thus, for instance, in the attempt to form a conclusion regarding the metamorphosis of the blood from an elementary analysis of its solid residue, and of the composition of the individual constituents of the excretions, there is an utter absence of all scientific ground work; for, independently of the fact that the elementary analysis of so compound a matter as the blood is incapable of yielding any reliable results, and cannot, therefore, justify the adoption of any special chemical formula, it is assuredly most illogical to attempt to compare the composition of the blood collectively, with that of the separate excrementitious matters." Page 3, 4.

Whilst acknowledging the indebtedness of the physiologist to the chemist, he remarks:

"Animal chemistry is still wholly unable to afford us a precise, and at the same time a practically useful method of investigating the blood; and how should it be otherwise while we continue to be in doubt regarding the chemical nature of its ordinary constituents? The mineral substances of normal blood are not yet determined, or, at all events, continue to be made the subject of dispute. We scarcely know the names of the fatty matters it contains; one of its most important constituents, fibrin, cannot be chemically exhibited in a pure state; we are ignorant of the nature and mode of secretion of the globulin of the blood-corpuscles; we are still far from being able to separate and determine the so-called protein oxides; and we are also ignorant of the excrementitious substances occurring in the blood. How then, amid these and a thousand other uncertainties and doubts, can an investigation of the blood be scientifically and trust-worthily conducted? We analyze healthy and morbid milk, and yet we are ignorant of the substances whose admixture we call casein. The urine, in its morbid condition, presents many varieties; and yet our knowledge of this secretion, frequently as it has been analysed, amounts to little more than an acquaintance with the quantitative relations of some of its principal constituents; creatinin and hippuric acid have not been determined by an analysis, and doubts are still entertained by some chemists, (although most unjustly,) regarding the presence of the latter in human urine, whilst nothing absolutely is known regarding the most important pigment of this secretion. Many experiments have been made, and theories broached on nutrition and digestion, and yet to almost the present day the existence of lactic acid in the gastric juice has been contested. Although hypotheses are not wanting regarding the mode of action of pepsin, we know nothing of its chemical nature, and we are wholly ignorant of the proximate metamorphosis of albuminous bodies in the stomach during the process of digestion. Will Mulder be able, even with his most accurate analyses, to support his protein theory by the aid of sulphamide and phosphamide? Or is this term destined merely to indicate a past epoch in organic chemistry? When such is the state of animal chemistry, can we wonder that there should be obscurity regarding the chemical processes in the animal body, their various isolated and combined actions, their casual connexion and their dependence on external influences and internal conditions?"

Our author then goes on to show that the organic substrata of the animal body (the proximate constituents and their derivatives,) should be thoroughly understood before venturing an opinion on the nature of the processes. For this reason the first volume of his work is devoted to the description

of the proximate and mineral constituents of the animal body under the following classes, viz:

"*Non-nitrogenous acids.*
1, Butyric acid group. 2, Succinic acid group. 3, Benzoic group. 4, Lactic acid group. 5, Solid fatty acids. 6, Oily fatty acids. 7, Resinous acids.
Nitrogenous basic bodies.
1, Non-oxygenous alkaloids, aniline, &c. 2, Alkaloids containing oxygen, creatine, &c.
Conjugated acids. Hippuric acid, &c.
Haloid Bases and Haloid salts. Oxide of lipyl, glycerin, &c.
Lipoids. Cholesterin, &c.
Non-nitrogenous neutral bodies. Glucose, lactine, &c.
Coloring matters. Hæmatin, &c.
Extractive matters.
Nitrogenous Histogenetic substances. Protein compounds and their derivatives.
Mineral constituents of the animal body.

Professor Lehmann is a close adherent to the actual and demonstrable and discards all the theories of the marvellous influence of vital force, independent of chemical reaction. He observes:

"How long were the minds of natural philosophers haunted with an illusion that animal bodies possessed the power of generating mineral elements, as lime, iron, sulphur, &c., from other elements, or even from nothing! It was this method [alluding to the statistical method of comparing the gross constituents of the food wi h the gross secretions and excretions] alone which exposed the perfect nullity of the obstinately defended dogma of the 'vital force.'"

Our author places physiological chemistry first in importance among the scientific auxiliaries to medicine. He also disapproves of drawing the line between pathological and physiological chemistry, and believes it is not only unnecessary, but attended with disadvantage, to sever them, as the same laws and forces are exerted in diseased as in healthy matter, the chemical points of application being different. He is strongly opposed to what is termed meta-physiology, the physiology of life action and force, as contradistinguished from the chemical forces of organic matter.

"We have not hesitated to avow that we have assumed a thoroughly radical point of view in reference to specific vital phenomena and vital forces; for we cannot rest satisfied with the mysterious obscurity in which they have been artificially enveloped. With the physicist, we would uphold the reality of phenomena, and while we admit that the consciousness of the reality of matter is only the result of an abstraction, we regard this abstraction, by which we regard the Immaterial, the Spiritual and the Force, as originating in reality. We therefore believe with the diffidence beseeming the genuine student of nature, that it would be wiser and more conducive to the spread of true knowledge to adhere, in the study of vital processes, to matter, and to the laws by which it is determined, than, following the fictitious abstractions of dynamical processes, to assume that there exists in life a higher power of the spiritual forces pervading matter."

In the application of chemistry to physiology our author demands the most imperative adherence to truth in analytical results; he lays down the sole conditions upon which the formula for an organic substance should be accredited, and then points to the innumerable results which are turned out of the laboratories, under circumstances depriving them of all respect, and which are seized upon by physiologists to be woven into theories as truthful as the basis on which they are erected.

In describing a substance our author first gives its properties, then its composition, next its combinations, then its preparations, next its tests, and lastly, its physiological relations.

We would gladly give further illustrations of the work, but our space will not admit; whatever difference of views there may be in reference to vital phenomena in the abstract, Professor Lehmann's logical adherence to the strictly demonstrable in physiological chemistry will render his book a faithful record of the real progress of that branch of science.

The Life of the Hon. Henry Cavendish, including abstracts from his more important scientific papers, and a critical inquiry into the claims of all the alleged discoverers of the Composition of Water. By George Wilson, M. D. F. R. S. E. London, Printed for the Cavendish Society, 1851, pp. 478.

This account of Cavendish and his works very appropriately emanates from a Society which has adopted his name. Perhaps no instance is on record of an individual, so celebrated for his scientific researches, so elevated in his family connections, so long a resident of the metropolis of Great Britain, for fifty years a member of the Philosophical Society, and one of the wealthiest men in England, about whom so little is known, and whose personal history was obscured by so impenetrable a veil of reserve. Mr. Cavendish was one of the most eccentric, and withal one of the most modest men that ever lived, and perhaps would hardly credit that, forty years after his death, a large volume would be written, a large portion of which is occupied with a tiresome discussion as to his claims to the discovery of the Composition of Water. Dr. Wilson, the biographer, has had a scarcity of materials to build up so extensive a volume, and while most will admit that he has made out a good case for his subject, it is at the expense of a vast deal of repetition. The celebrated characters who, in person or through their friends, have laid claim to that discovery, have given a historical importance to the matter far greater than it deserves, as all will now admit that the great fact was gradually evolved during the pursuit of experiments on air by at least two individuals, and was not the result of *a priori* reasoning followed by direct experiment, as in Davy's discovery of Potassium.

Elements of Chemistry; including the applications of the Science in the Arts. By THOMAS GRAHAM, F. R. S., &c. *Second American, from an entirely revised and greatly enlarged English edition, with numerous wood engravings.* Edited, with notes, by ROBERT BRIDGES, M. D., Prof. of Chemistry in the Philadelphia College of Pharmacy, etc. Philadelphia, Blanchard & Lea, 1852. [Part I. pp. 430 octavo.]

We acknowledge the reception of the first part of this excellent treatise, from the publishers, with pleasure. The author has long been engaged on the work, and is giving a more than usual amount of time and research to its revision, not only as regards those parts where the progress of science renders it absolutely necessary, but in numerous tabular expositions, in an increased accuracy of the numbers, in an improved arrangement of subjects, and in the adoption of hydrogen as unity in equivalent proportions, so as to agree with the larger number of English chemical writers. The subject is carried as far as the earthy-basic metals, including the physics of chemistry, chemical philosophy, the non-metallic elements and their mutual compounds, and the alkaline, alkaline-earthy, and earthy-basic metals and their compounds. Among the special additions we may notice the table of specific heat of gases, Mr. Hutchinson's table of the heat-resisting power of building materials, the method of obtaining the latent heat of volatile liquids, the recent results of Faraday and others in refrigeration by means of solid carbonic acid, with a figure of Thilorier's apparatus, observations on the effusion and transpiration of gases, quite new, Regnault's condenser hydrometer, the subject of specific heat, and the table of the specific gravity of gases and vapors, have been much extended, and the discoveries and improvements in apparatus in relation to chemical polarity have been added and illustrated.

In regard to the arrangement of subjects, Prof. Graham has placed ammonia under the head of nitrogen; oxalic acid, the *hydrides* of carbon, and cyanogen, under the head of carbon; the new compounds of sulphur and oxygen hydrosulphuric acid and sulphide of nitrogen, under the head of sulphur, and the compounds of phosphorus with hydrogen and sulphur under phosphorus. This part of the work has been much extended, portions of it re-written, and the illustrations greatly increased in number and beauty. The subjects of water, atmospheric air, the varieties of phosphoric acid, and the oxygen compounds of chlorine, have been more especially improved. So much for the author, who, as Prof. Bridges justly remarks, has left but little for the Editor. Owing, however, to the publication of the English edition in small parts, at considerable intervals, several recent and important discoveries have been omitted in the English edition. The introduction of these, among which may be mentioned Deville's anhydrous nitric acid and red phosphorus, and the correction of misprints and errors incident to all authors, and which the well known accuracy of Prof. Bridges is well calculated to meet, give a decided advantage to the Ameri-

can edition, especially in view of the excellent style of the typography and engravings, which are very creditable to the publishers. As a manual for the guidance of the student of general chemistry, the "Elements" of Prof. Graham enjoy deservedly the very highest rank among English chemical treatises.

Dictionnaire des Alterations et Falsifications des Substances Alimentaires, Medicamentenses et Commerciales avec l'indications, des moyens de les reconnaitre. Par M. A. Chevallier, Pharmacien Chimist, Prof. à Ecole de Pharmacie, etc. Vol. II., Paris, 1852, pp. 580 with plates.

The first volume of this work was noticed succinctly on page 95, vol. xxiii. of this Journal. The present volume, which completes the book, is more extensive than the first, and has required, from the nature of several of its articles, a greater amount of labor. The subjects extend from L to Z, and include a large number of important articles in medicine and the arts. Among the subjects which have attracted most attention among alimentary substances, are *milk, honey, pepper, common salt, sugars, vinegar, and wines;* of commercial substances, *papers, resins, saltpetre, sal soda, soaps, sulphates,* and *tobacco;* and, of the very numerous medicinal substances, a few are *magnesia, manna, sulphur, opium, cinchona, scammony, syrups, sulphate of quinine* and other medicinal sulphates.

M. Chevallier does not confine his subject to artificial products, but includes nearly the whole range of medicines, barks, leaves, flowers, seeds, but many of the articles go no further than the same subjects are carried in the works on Materia Medica, and are introduced as much to swell the size of the work as for any tangible means of judging they offer.

The work, as the title indicates, is by no means solely directed to the pharmaceutist; indeed its most elaborate articles are on subjects connected with the manufacturing arts, as soaps, vinegars, wines, breadstuffs, milk, etc. As a whole, the "*Dictionnaire*" is well worth a place in the pharmaceutical library, and contains a large amount of information derived from innumerable sources. We shall occasionally publish a few extracts from it.

The Communication of Dr. W. Manlius Smith, of Manlius, New York, having arrived too late for this number, will appear in the October issue.

Our Journal.—We consider it objectionable, as a general rule, to issue a journal before it is due, and have endeavored to be as punctual to the beginning of the month as possible. In the present instance, to accommodate ourselves, we have served our subscribers perhaps before their appetites have awakened.

PHARMACY IN RICHMOND.—Just as we were going to press the following call, issued to the Richmond apothecaries by some of their number, was received from Mr. Laidley. The meeting to which it refers was subsequently held, and measures taken for the organization of a pharmaceutical society. We understand that one of the proposed conditions of membership, is *proprietorship in business*, which is certainly an error in judgment, as some of the best members of our College have been those not proprietors.

The undersigned, believing that by friendly co-operation among themselves, their respectability will be increased; their standing in the community will become more elevated, faults in their profession be remedied, evils to which they are now subjected be removed; that their art may be more systematized, and better regulated; a more friendly feeling towards each other be excited amongst them, their mutual interests advanced, and the public good promoted; do most earnestly call upon their brethren engaged in Pharmaceutical pursuits, to meet at the Gentlemen's Parlor, Exchange Hotel, on Friday evening, 11th inst., at 8 o'clock, for the purpose of considering the advantages that would result to all of them, from the formation of some organized Association, that would have for its object the above named desirable ends; as well as to encourage among themselves mutual improvement in the knowledge so necessary to a proper discharge of those duties, (both to themselves and the public,) which their situations as men occupying positions among the most responsible in life, impose upon them.

As the organization which it is now proposed to form, would contemplate the good of all its members, it is most earnestly hoped that all the Druggists and Apothecaries who feel any interest in this important subject, will cordially unite their intelligence and talents in an effort to accomplish the above named ends, and that the proper preliminary steps will be taken for the formation of a society of the Apothecaries in this city, which will prove beneficial to its members, an honor to their profession, and a credit to the city of Richmond.

ANDREW LESSLIE,	SEABROOK & REEVE,	H. BLAIR,
S. M. ZACHRISSON,	ADIE & GRAY,	CHAS. MILLSPAUGH,
PURCELL, LADD & CO.,	PEYTON, JOHNSTON & BRO.,	ALEX. DUVAL.

Richmond, June 8th, 1852.

PHILADELPHIA COLLEGE OF PHARMACY.—We would call attention to the advertisement of the School of Pharmacy of this Institution. It will be perceived in addition to the usual full courses on Chemistry, Pharmacy and Materia Medica, that Prof. R. P. Thomas will give a preliminary course to *matriculants* on Medical Botany, which will prove extremely useful to the students who have not given their attention to this branch of science before entering the school.

The Philadelphia Medical and Surgical Journal, Edited by an Association Physicians.—We have received the first and second numbers of this new Medical Journal which is issued semi-monthly, each number containing sixteen pages.

ERRATUM.—*Purgative Syrup of Jalap.* In the formula for this syrup in the last number of the Journal at page 169 read *"jalap eight ounces"* instead of *"jalap an ounce."*

THE

AMERICAN JOURNAL OF PHARMACY.

OCTOBER, 1852.

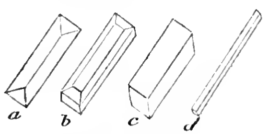
OBSERVATIONS ON THE VOLATILITY AND SOLUBILITY OF CANTHARIDIN IN VIEW OF THE MOST ELIGIBLE PHARMACEUTICAL TREATMENT OF SPANISH FLIES.

By William Procter, Jr.

Cantharides have been used in Pharmacy since the days of Hippocrates. It was not till 1810, however, that the principle giving them activity was isolated by Robiquet (Annal. de Chimie lxxvi. 302,) and subsequently named *Cantharidin* by Dr. Thomas Thompson. Since then various experimenters have been engaged in the chemical investigation of these flies, and in the more recent treatises they are stated to consist of *cantharidin*, *yellow fixed oil*, *green fixed oil*, *a yellow viscous substance*, *a black matter*, *ozmazome*, *uric acid*, *acetic acid*, *phosphoric acid*, and the *phosphate of lime and magnesia.* It is proverbial among apothecaries and physicians, that the pharmaceutical preparations designed to produce vesication, vary very much in their power as prepared by different individuals, and from different samples of cantharides by the same recipes. Is this variableness of power due to the inequality of strength of the commercial drug? or, are we to attribute it to the treatment employed by the apothecary? The real importance of these queries demands an answer. To proceed properly, the investigator should examine cantharidin in a pure state, ascertain how far the statements of writers are cor-

rect, then by a series of analyses, quantitative as regards that principle, determine whether its proportion varies, and to what extent, in different specimens of cantharides of fair quality; and finally to test the preparations derived from the same samples and see how far they correspond with the inferences drawn from the ascertained properties and proportions of the active principle. I have at present undertaken to resolve but a part of these queries—yet by far the most important ones—as will be seen.

Cantharidin is a white, neutral substance, of which the formula according to Regnault is $C_{10}H\ O_4$. Gmelin considers it of the nature of a solid volatile oil. As usually seen it has the form of minute flattened four-sided prisms (*c*,) much broken up, so as to appear like scales. When deposited from an ethereal solution of cantharides by slow evaporation, or from its solution in hot acetic acid by cooling, it assumes the form of flattened oblique four-sided prisms with dihedral summits, derived from the rectangular prism by the bevelment of its edges (see fig. *a* and *b* from *c*.) The crystals by slow sublimation are four-sided rectangular prisms of great brilliance and sometimes iridescent, *c* & *d*.



Solubility. Pure cantharidin is insoluble in water hot or cold. It is slightly soluble in cold alcohol, readily so when hot. Ether dissolves it to a greater extent, yet much more easily hot than cold. Chloroform is its best solvent, cold or hot, as shown in a former essay (Am. Jour. Pharm. vol. xxiii. 124,) and will remove it from the aqueous infusion of the flies. Acetic ether dissolves cantharidin, especially when hot, but does not retain much on cooling. When one part of cantharides is mixed with 20 parts of olive oil and heated to 250° Fahr. it is completely dissolved. As the solution cools, the cantharidin rapidly separates in shining needles in such quantity as at first to give the oil a pulpy consistence. The clear cold oil retains sufficient to act as an efficient rubefacient but not as an epispastic. One part of cantharidin requires 70 parts of oil of turpentine to dissolve it at the boiling temperature, the greater part separating, as the solution cools, in long asbestos-like needles. A piece of paper saturated with the cold solution and applied to the skin under adhesive plaster did not vesicate. Acetone (from the distillation of acetate of lime)

dissolves cantharidin with great readiness, and ranks next to chloroform in this regard. The solution deposits the substance in crystals by evaporation. The commercial methylic alcohol or wood naphtha also dissolves cantharidin, but to a much less extent than acetone. When acetic acid sp. gr. 1·41 (U. S. P.) is added to cantharidin, it but slightly acts on it in the cold; heat much increases its solvent power, which is lost on cooling and the substance deposited by standing, though not immediately. One part of cantharidin was mixed with 40 parts of *crystallizable* acetic acid and agitated together during five hours, but a small percentage was dissolved; but on applying heat the crystals were dissolved quickly. On standing, nearly all of the cantharidin was slowly deposited in regular crystals. To ascertain whether, as has been asserted,* a combination was effected, and an *acetate* of cantharidin produced, an acetic solution of cantharidin was evaporated to dryness and the crystals mixed with strong sulphuric acid and heated till dissolved, while the nose was held near, without the slightest evidence of acetic odor; one-twentieth of a grain of acetate of potassa was then added, which instantly evolved the well marked smell of acetic acid. Formic acid dissolves but a trace of cantharidin cold or hot; and muriatic acid sp. gr. 1·18 hardly can be said to act on it in the cold, but when boiling a minute portion is taken up. The same is true of phosphoric acid dissolved in five parts water. Sulphuric acid sp. gr. 1·840, when heated readily dissolves pure cantharidin without being discolored, and deposits it in crystals unchanged by cooling. Hot nitric acid sp. gr. 1·38, dissolves cantharidin readily, and deposits the greater part of it on cooling in brilliant crystals, unchanged. A concentrated solution of ammonia slowly dissolves cantharidin to a small extent, and yields it up on evaporation in crystals. Solutions of potassa and of soda also dissolve this principle.

Its Volatility.—About ten grains of pure and perfectly dry cantharidin was spread on the pan of an Oertling's balance, (sensitive to 1-150th of a grain,) and the equilibrium carefully adjusted with platina weights. After exposure for a week to the action of the air, a vessel of lime being present to keep the air dry, no change in the adjustment had occurred. To further test the volatility of cantharidin, a portion of it was put at the bottom of a dry test tube,

* New York Jour. Pharm. vol. i. p. 72.

through a paper funnel so as not to soil the sides, which was then fixed so as to dip half an inch in a mercurial bath having a thermometer suspended in it. It lost nothing appreciable after being kept at 212° F. for half an hour, no sublimate being visible with a lens. At 220° F. no visible effect was produced. Kept at 250° F. for 20 minutes, a very slow sublimation commenced. At 300° F. the vaporization was but slightly increased. The heat was then raised to 360° F., when the sublimation became more decided, yet still slow. Between 402° F. and 410° F. it fused, and rapidly sublimed at a few degrees higher. Cantharidin at this temperature volatilizes with great ease and condenses in beautiful well defined crystals like salicylic acid.

The specific gravity of cantharidin is considerable, as it sinks in nitric acid sp. gr. 1·38; it is exceedingly acrid; its powder applied to the skin with a little oil, produces speedy vesication, and taken internally it is an irritant poison of the most virulent kind.

Such are some of the more prominent characters of this remarkable substance, which exhibits a permanence and want of affinity extraordinary in an animal principle. Let us now see how far experiments with cantharidin as it exists in the flies in substance, correspond with its behavior in an isolated state.

1st. Is cantharidin, as it exists in Spanish flies, volatile at common temperatures, or at the temperature usually employed in making the cerate; and if so to what extent?

a. Six hundred grains of powdered cantharides were put into a quart flask, a pint of water poured on, and macerated two hours. The flask was then adapted to a glass tubulated receiver by means of a long glass tube, the joints made tight, and the tube refrigerated throughout its length by a current of cool water, the receiver itself being surrounded by water. A sand-bath heat was then applied and the materials in the flask kept boiling during several hours, until half a pint liquid had distilled. The product in the receiver was opalescent, with white particles floating through it, and had a strong odor of Spanish flies. It was decanted into a bottle, and agitated repeatedly with half an ounce of chloroform, which dissolved the particles and removed the opalescence. The chloroform, when separated with a funnel, and evaporated spontaneously, yielded a colorless semi-crystalline residue, having a waxy consistence and a strong odor different from that of the flies. It fused at 120° Fahr., was volatile *per se,* but was

partially decomposed and condensed in drops which subsequently solidified. This substance is soluble in alcohol, ether and chloroform, is decomposed and dissolved by sulphuric acid, produces *no signs of vesication after forty-eight hours' contact with the skin* under adhesive plaster, and is most probably the same volatile principle that has been noticed by Orfila.

The long glass tube was then examined for a sublimate, by rinsing it thoroughly with chloroform, which, on evaporation, afforded more of the same substance obtained from the distilled water, and like it did not produce vesication.

This experiment shows conclusively that cantharidin *does not volatilize to an appreciable extent with water evaporating from cantharides.*

b. More water was added to the residue in the flask, again boiled for fifteen minutes and thrown on a displacing filter, and water added to the solid residue, after the decoction had ceased to pass, until the absorbed liquid was displaced. The decoction was much less odorous than the distilled water, and had a deep reddish-brown color. Half of this was agitated repeatedly with chloroform. The latter decanted and evaporated yielded a crop of crystals intermixed with some coloring matter. A part of these heated in a tube over a lamp, gave immediately the brilliant crystalline sublimate of cantharidin well marked; another portion applied to the skin produced vesication in a few hours.

The other half of the decoction was evaporated to a soft extract by direct heat. This produced speedy and deep vesication, more effectual than that of pure cantharidin, as in the extract that principle was in a soluble state by virtue of the yellow matter of the flies.

c. The residual flies were then dried carefully and exhausted with ether, which assumed a deep green color. A green semifluid fatty oil was obtained by evaporation, from which a fluid yellow oil separated by standing, which produced a tardy vesication, not comparable with the aqueous extract.

d. One hundred grains of flies in powder were introduced into a test tube so as not to soil the sides. This was then kept at the temperature of 212° F. during six hours, by causing it to dip into a vessel of boiling water through a tin plate. The hygrometric water was removed as it condensed above. At the

end of the experiment a minute deposit of microscopic crystals less than one thirtieth of a grain, was observed above the flies on the sides of the tube.

e. Two hundred grains of flies were introduced into a two ounce retort, which they half filled, adapted to a two ounce receiver, and this again connected with a third vessel. The retort heated by a mercurial bath, was kept at 225° F., for two hours, without any product except a little odorous hygrometric water. The heat was then raised to 412° F., when a colorless oily matter flowed slowly into the receiver, mixed with water, whilst a crystalline matter mixed with oil collected in the neck. This crystalline matter mixed with the oil produced vesication when applied to the skin. The heat was now rapidly increased so as to produce brown vapors, from which was condensed a dark colored empyreumatic oil, abundant crystals of an ammoniacal salt collected in the tubes and on the sides of the receiver, whilst the aqueous liquor in the receiver was strongly ammoniacal. Neither the dark oil nor the crystals produced vesication, the high temperature having probably decomposed the cantharidin.

From these experiments it must be admitted that cantharidin is less volatile than has been asserted. The effect produced on the eye of the pupil of Robiquet who was watching the crystallization of cantharidin during the evaporation of an ethereal solution, may be accounted for by the mechanical action of the dense ethereal vapor escaping near his eye, as he watched the process with a lens, carrying off some particles of cantharidin; and the readiness with which this principle may be brought mechanically in contact with the skin of the face, during a series of experiments, by want of care, will easily account for the occasional testimony of writers in favor of its volatility at low temperatures based on that kind of evidence. During the whole of the experiments detailed in this paper, the author has not experienced any inconvenience to his eyes or face except in two instances, once when decomposing cantharides by destructive distillation, during which some of the vapors escaped near his person, and again where a small capsule containing aqueous extract of cantharides was accidentally exposed to high temperature over a lamp so as to partially decompose it; he suffered slight pain for a few hours in the conjunctiva of both eyes.

It must also be admitted that the heat ordinarily employed in making the blistering cerate of the United States Pharmacopœia, does not injure the preparation by volatilizing the cantharidin, and that the recommendation to digest the flies in the melted vehicle on a water bath is not only not injurious, but decidedly advantageous, as it increases, many fold, the solvent power of the fatty matter.

2d. Having ascertained the solvent powers of olive oil, oil of turpentine and acetic acid, on pure cantharidin, the following experiments were made with those menstrua, and with water, on the flies in substance:

a. One hundred grains of powdered cantharides were mixed with two hundred grains of olive oil in a large test tube, which was corked, and the mixture heated in a boiling water bath during four hours, with occasional agitation. The contents of the tube were then poured into a small glass displacement apparatus, surrounded with water kept hot by a lamp, and the saturated oil gradually displaced, without cooling, by the addition of fresh portions of oil. The oily liquid thus obtained had a deep green color, smelled strongly of the flies, and when applied to the skin produced full vesication in about twelve hours contact. After standing twenty-four hours shining needles of cantharidin gradually separated, but not in quantity.

b. One hundred grains of powdered flies were mixed with two hundred grains of pure oil of turpentine in a closed tube, heated in a boiling water bath four hours, and displaced while hot as in the preceding experiment. The terebinthinate solution had a dull yellow color, and was perfectly transparent as it passed, but in a short time numerous minute stellated crystals commenced forming, which increased in quantity by standing. The saturated cold solution, separated from the crystals after standing twenty-four hours, did not blister when applied to the skin.

c. One hundred grains of powdered flies were digested in a close vessel, at the temperature of boiling water, in three hundred grains of acetic acid sp. gr. 1.041, for six hours, and then subjected to displacement in the hot filter above noticed. A dark reddish-brown transparent liquid passed, which had very little odor of flies, even when a portion was exposed until the acetic acid had nearly all evaporated. A portion of this liquid applied to the skin produced complete vesication in about ten hours. After standing a few

hours, numerous minute granular crystals were deposited, which gradually increased in amount and size.

These three experiments prove that hot fatty matter is a good solvent for cantharidin as it exists in the flies, and that it retains more on cooling than either turpentine or acetic acid. That hot oil of turpentine is a good solvent for extracting cantharidin, although it does not retain much on cooling, and that officinal acetic acid at the temperature of 212° F. will remove cantharidin readily from Spanish flies, but retains but a part on cooling.

d. Five hundred grains of recently powdered flies, contained in a flask, were boiled in a pint of water, for an hour, and the clear decoction decanted, the residue again treated with half a pint of water, so as to remove all matter soluble in that liquid. The decoctions were mixed, filtered, and evaporated carefully to dryness. The extract was exhausted by repeated treatment with boiling alcohol, which left a dark colored pulpy matter, very soluble in water, from which it is precipitated by subacetate of lead. The alcoholic solution was now evaporated to a syrup, and on cooling yielded a yellow extract like mass, interspersed with numerous minute four-sided prisms. By washing a portion with water, the yellow matter was removed, leaving the crystals white and pure. The aqueous washings yielded by evaporation a residue of crystals, and does not vesicate. When the alcoholic extract was treated with chloroform the crystals were dissolved, and the yellow matter left. On evaporating the chloroform solution the crystals were re-obtained with all the characters of cantharidin. The matter left by chloroform was now treated with water, in which it dissolved, except a trace of dark substance, and was again evaporated carefully. It afforded a yellow honey-like residue, thickly interspersed with crystals and strongly acid to litmus, without vesicating power.

A portion of the yellow matter separated from the alcoholic extract by water was boiled with some cantharidin, filtered and evaporated. The residue treated with chloroform afforded no cantharidin; hence it would appear that although the yellow matter enables the cantharidin to dissolve in water and cold alcohol, when once separated its solvent power ceases.

Having now studied the effects of the ordinary solvents on cantharidin in a free state, and in the condition in which it exists

in the insect, we are prepared to consider with some clearness, the pharmaceutical preparations of the Spanish fly, and their action as vesicants.

a. If 1-30th of a grain of pure cantharidin, in fine powder, be placed on the skin of the arm and covered with a piece of warmed adhesive plaster, active vesication occurs in eight hours, with pain. If the same quantity of cantharidin be put on the other arm, a small piece of paper be laid over it, and then a piece of adhesive plaster with a circular hole in it be applied, so as to hold on the paper, no vesication occurs in sixteen hours, the powder remaining dry. If then a large piece of plaster be put over the whole, at the end of eight hours more no blistering action will have taken place. If now a trace of olive oil be applied to the back of the paper covering the cantharidin, and the plaster replaced, speedy vesication will occur. These experiments prove that cantharidin must be in solution to have its vesicating action, and that oily matter is a proper medium.

b. When powdered flies are stirred into the ordinary vehicle of resin, wax, and lard, so as to chill it almost immediately as was formerly directed, but little of the cantharidin is dissolved by the fatty matter, and when applied to the skin the process of vesication is retarded. If, however, the cerate be kept fluid for a length of time, say for half an hour, by a water-bath or other regular heat, no loss of cantharidin occurs by the heat, the active principle is in great measure dissolved by the fat, and every part is impregnated and active. In the foregoing experiments it has been shown that twenty parts of olive oil will dissolve one of cantharidin when hot. If we admit with Thierry that cantharides contain but four thousandths of their weight of cantharidin, the quantity contained in a pound of cerate is about *eight* grains, whilst the lard in the same weight of cerate is 1600 grains, or two hundred times the weight of that principle, not to speak of the influence of the wax and resin, which, in union with the melted lard, act as solvents. Hence the whole of the cantharidin may be dissolved by the vehicle. Another advantage of employing a continued heat in digestion is the removal of the hygrometric water from the flies, which is the source of the mouldiness to which the cerate is prone in certain conditions.

In a former essay (Amer. Journ. Pharm., vol. xiii, p. 302,) I have

advocated digestion in making this cerate, (a recommendation also made by Mr. Donovan, of Dublin, about the same time,) and also the use of a portion of the oil of turpentine to facilitate the solution of the cantharidin, but the foregoing experiments prove that fatty matter is quite as good, if not a better solvent alone than with turpentine.

c. It has been asserted long ago by Beaupoil, Robiquet and others, that water will perfectly extract the active matter from Spanish flies, which these experiments corroborate. Hence it is easy to understand how the condensed perspiration may facilitate the action of a blister, especially when, as was formerly much the case, its surface is coated with the dust of the flies, and the skin moistened.

It is also clear why the Unguentum Cantharidis of the U.S. Pharmacopœia is active although made with a decoction of flies, yet, in this preparation, care should be observed not to evaporate all the water, as on the existence of the aqueous extract in a soft state depends much of the efficiency of the preparation as an irritant dressing.

d. In the Linimentum Cantharidis, U. S. Pharm., in which an ounce of flies is digested in eight fluid ounces of oil of turpentine, the cantharidin is to the menstruum as 1 to 1500, a proportion probably quite sufficient to retain it in solution. The importance of the officinal direction to digest is evident. It is quite doubtful whether this liniment, as made by the process of Dr. Jos. Hartshorne, one part of flies to three parts of oil, will retain all the cantharidin after standing awhile.

e. The Acetum Cantharidis, (Lond. Ph.) made by macerating an ounce of flies in ten fluid ounces of acetic acid, 1.48, has been criticised by Mr. Redwood, (Pharm. Journal, Oct. 1841,) who arrived at the conclusion that it owed its vesicating power almost solely to the acid, he not being able to discover cantharidin in it. The inefficiency of *cold* acetic acid as a solvent for *pure* cantharidin has been proven by the above experiments, and its efficiency when hot equally shown. There can be little doubt that the London preparation would be much improved by *digesting* the flies in the acid for an hour in a close glass vessel at the temperature of boiling water.

f. The *cantharidal collodion* of M. Ilisch has been considerably

used as a vesicant in this country. Ether being a good solvent for cantharidin readily keeps that principle in solution. When applied to the skin, the escape of the ether leaves a coating of ethereal extract of cantharides, admixed with collodion. This preparation sometimes fails from a deficiency of cantharidin, at other times from want of a sufficient body in the collodion excipient, and it has been found more advantageous to treat the cantharides with ether till exhausted, distill off the ether, and add the oily residue to collodion of the proper consistence. The addition of a little olive oil, and of Venice turpentine, as recommended by Mr. Rand, will give more activity to the preparation, especially if a piece of oiled silk or adhesive plaster be applied over the part.

g. Besides these, many other epispastic preparations are made in France and other countries. The acetic alcoholic extract of cantharides of Ferrari is made by digesting four parts of cantharides in sixteen parts of alcohol 36° B. mixed with one part of acetic acid 10° B. In the opinion of the author, the acetic acid tends to prevent the crystallization of the cantharidin, a statement rendered doubtful by the above experiments, as that principle separates in crystals from an acetic solution of cantharides. The alcohol dissolves the green oil which gives to the extract a butyraceous consistence. This is undoubtedly an efficient preparation, and is used by spreading it on paper with a brush, and applying to the skin. Nearly all the French preparations direct digestion of from 2 to 6 hours, showing evidently that the experience of pharmaceutists is opposed to the opinion that cantharides is "a very volatile substance, even at common temperatures."

The vesicating tafeta of the Codex, is that proposed by Messrs. Henry & Guibourt, and is made by fusing together one part of the ethereal extract of cantharides and two of wax, and spreading it on waxed paper or linen in the manner of adhesive plaster. This preparation is said to lose its efficiency by exposure to the air. How can this occur in view of the results which have been detailed above? admitting the fact, is it not probable that the change lies in the strong tendency of the cantharidin to separate in crystals? a change easily observable in the ethereal extract. This is the chief objection to some otherwise excellent preparations of cantharides for vesication, and it is far more probably the true explanation, than that volatility should be the cause.

The recently prepared and soft aqueous extract of cantharides has been shown to be a powerful epispastic. Will this extract of the consistence of honey, associated with sufficient acetic acid, alcohol, or acetone, to preserve it, keep without the gradual separation of the cantharidin? If so, it will undoubtedly prove one of the very best blistering agents, as by simply applying a covering of it over the surface of waxed paper, or adhesive plaster, with a camel's-hair brush, a perfect blistering plaster can be made quickly and neatly, and all tendency to change of aggregation by the action of the air on the menstruum avoided. This is a question now under trial, and should it result favorably, a formula will be published. The extraordinary tendency of cantharidin to crystallize, even under the most adverse circumstances, taken in connection with its insolubility, *per se*, has hardly received sufficient attention from pharmaceutists as a cause of the deterioration of cantharidal preparations, and the discovery of a menstruum, that will retain that principle in solution for an indefinite period, is a problem yet to be solved, and worthy the attention of pharmaceutical investigators.

Philadelphia, Sept, 1852.

OBSERVATIONS ON CERTAIN COMPOUNDS OF IODINE WITH QUINIA AND CINCHONIA, AND ON SEVERAL PREPARATIONS FROM PODOPHYLLUM, SANGUINARIA, AND CONIUM.

By W. Manlius Smith, M. D.

A portion of my medical studies were conducted under the private instruction of Dr. William Tully, of New Haven, (now of Springfield, Mass.) That gentleman was in the habit of prescribing in scrofulous diseases a preparation he called *protiodide of quinium*, the termination *um* being in analogy with ammoni*um*, on the supposition that the reaction occurring is similar to that where ammonia is presumed to become ammonium by combination. His formula was simply this:—To a known quantity, say one equivalent of disulphate of quinia, dissolved in the smallest possible quantity of boiling distilled water, a quantity equal to two equivalents of iodide of potassium was added. Sometimes, though

not always, a slight yellow tint was produced in the liquid. On cooling beautiful stellated groups of crystals were formed, bearing a resemblance to the disulphate of quinia. Occasionally but few crystals were formed, but in place of them an amorphous resin-like substance adhered to the sides of the vessel. It was considered preferable to obtain the iodide in the latter form, as it could be made into pills without an excipient. The pills after being made a short time become firm and hard.

In reflecting on Dr. Tully's formula, it occurred to me that a sub-iodide of quinium, or perhaps an oxy-iodide, was formed while an equivalent of iodide of potassium was in excess, as the mother-liquid contains much of the latter salt as indicated by corrosive sublimate. It then appeared to me that in order to form the prot-iodide the neutral sulphate of quinia should be used. I then added half an equivalent of sulphuric acid to one equivalent of disulphate of quinia in sufficient water, and afterwards one equivalent of iodide of potassium, when a transparent yellow liquid resulted, which on standing a short time assumed a gelatinous consistence. By pressure the greater part of the liquid was separated, leaving a light yellow mass that was easily pulverizable when dry, but not crystallized. The expressed liquid again became gelatinous from the separation of more of the salt.

I afterwards formed a double iodide of quinium and potassium, by adding to the solution of neutral sulphate of quinia as much iodide of potassium as was equal to two equivalents ; a yellow precipitate occurred, which became crystalline on standing, and assumed the form of small feathery prismatic crystals. This salt probably contains water of crystallization, as the product obtained is greater than on theory it should be, if anhydrous.

By similar and parallel processes, *protiodide of cinchonium* and *double iodide of cinchonium and potassium* were made. I formed what I suppose are the deutiodides of cinchonium and quinium, by precipitating the potassium from the double iodide of these bases and potassium, by means of an alcoholic solution of tartaric acid, in the form of bitartrate of potassa. The solution after being filtered was evaporated spontaneously. The salt of quinia is in the form of a deep brown amorphous mass : that of cinchonia in fan-shaped clusters of crystals.

A solution of iodide of cinchonium and potassium in alcohol, is

decomposed by spontaneous evaporation, as iodide of potassium in cubical crystals separates to some extent.

I have formed in a manner analagous to that used in making the preceding compounds, salts in which bromine replaced the iodine, with quinia and cinchonia. They are all white or brownish-white preparations, more soluble in water than the iodides, and forming larger crystals. I have succeeded in making several compounds in which iodide of sodium replaced iodide of potassium.

The term *podophylline* is applied to the resin of podophyllum pellatum by the so-called "eclectic practitioners." As prepared by them, the alcoholic tincture of the root is distilled to remove the alcohol, and the resin which separates as the alcohol distils off is removed from the watery liquid, dried and powdered. I consider a better mode is to concentrate the tincture till most of the alcohol is evaporated, and throw the residue into water when the resin precipitates. The consistence of the resinous liquid before precipitation by water is important, because if too concentrated the resin separates in clots, and is not easily washed. In its purest state this resin is colorless. See the Inaugural Essay of Mr. John R. Lewis, Amer. Jour. Pharm., Vol. xix. page 165.

This resin of podophyllum will purge a susceptible person quite thoroughly five or six times, the last evacuations being very watery and copious. Two grains will purge actively persons of ordinary susceptibility, and three grains will generally suffice for almost any one. Some persons experience nausea and even vomit, though I do not know that they are more affected by this article than by any other active cathartic. The eclectics also prepare *Macroytin* from the root of Cimicifuga racemosa, *Leptandrin* from Leptandra virginica, and *Sanguinarin* from Sanguinaria canadensis. The latter substance is to be distinguished from the *Sanguinarina* of Dana, which is an alkaloid. I have prepared some of the sulphate of sanguinarina by the process given in Silliman's Journal, 1831, Vol. 2d, page 503 and 504. Dr. William Taylor, of this neighborhood, has used this sulphate as an expectorant in lung diseases, and has been very favorably impressed by its action. He used it in doses of about one-fourth of a grain.

I have also prepared the "preserved juice" of Conium maculatum, (see U. S. Disp., 6th edit., p. 1159,) by adding one part of alcohol to two parts of the recent juice and filtering. It appears

to possess the narcotic properties of conium in perfection; most subjects will be inconveniently effected with half a fluid drachm; some, however, will tolerate one fluid drachm or even more.

[NOTE BY THE EDITOR.—The preceding observations by Dr. Smith, constitute the substance of a letter to Dr. Wood, of the University of Pennsylvania, which was placed in our hands with permission to make such use of it as we thought best. We would remark, in reference to the first substance described by Dr. Smith, that the same compound was prepared, analysed, and described by Messrs. Lewis and Husband, in the 16th volume, page 21, of this Journal, April, 1844. These gentlemen consider it a dihydriodate of quinia, and state that the additional equivalent of iodide of potassium is necessary to the reaction. They tried to make a monohydriodate with neutral sulphate but did not succeed, as they obtained the di-salt with free sulphuric acid.

Liebig (Chimie Organique, tome ii. p. 580,) refers to two salts of hydriodic acid and quinia; a basic salt, and a neutral one, but does not describe the mode of preparation.

In reference to Dr. Smith's nomenclature for the compound he describes, he is hardly justified in carrying out the analogy to the vegetable alkaloids. Ammonium is but partially conceded, notwithstanding its amalgum with mercury. It would have been more satisfactory to have had fair proximate analyses of these compounds before naming them. The reader is referred to Vol. xxiii. page 329 of this journal for some fuller information on the preparation of the eclectic remedies alluded to by Dr. Smith.]

ON GELSEMINUM SEMPERVIRENS OR YELLOW JASSAMIN.

BY WILLIAM PROCTER, JR.

Considerable attention has recently been turned to the Yellow Jassamin of our Southern States, from the accidental discovery of certain remarkable effects produced by it when taken internally. A planter of Mississippi having suffered much from a tedious attack of bilious fever, which resisted the usual medicines employed in such cases, requested one of his servants to obtain from the garden a certain root, from which he intended to prepare an infusion for drinking. By mistake, the person sent collected a different root, and administered the tea to his master, who, soon after taking it, was seized with a complete

loss of muscular power, being, in fact, so completely prostrated as to be unable to move a limb or to raise the eye-lids, yet he could hear and could appreciate what was occurring around him. After some hours, during which his friends were watching him with much anxiety and little hope, he gradually recovered his muscular control, and was astonished to find that the fever had left him. Having ascertained from his servant what plant he had collected, he subsequently employed it successfully on his own plantation as well as among his neighbors. The history becoming known to a quackish physician, he prepared from it a nostrum called the "Electrical Febrifuge," in which it was disguised by oil of winter-green, (*Eclectic* Dispensatory, page 186.)

The Gelseminum is not noticed by Dr. Griffith in his Medical Botany, nor in the recent edition of the United States Dispensatory, and so far appears to have been used chiefly by the "Eclectic" practitioners of Cincinnati and other parts of the Western States. The accompanying description of the plant is taken partly from a specimen sent from Memphis, Tennessee, where, in common with other parts of the south-western States, it is cultivated as an ornamental garden plant.

The Gelseminum belongs to the natural order Apocyneæ, so remarkable for the great activity of many of its genera, and the name of the genus, given by Jussieu, is one of the ancient names of the jassamine, and that of the species arises from its evergreen foliage.

Gelseminum belongs to Pentandria Digynia of Linnæus, and to the natural order Apocyneæ of Jussieu.

Generic characters.—Regular, calyx five parted, (the sepals of this species being furnished with bract-like appendages) carolla funnel-form, border spreading, five lobed, nearly equal, capsule compressed, flat, two partible, two-celled, seeds flat and attached to the margins of the valves, (Eaton.)

Specific characters.—The G. sempervirens is known at the South under the names *yellow jasmine*, *wild jasmine* and *woodbine.* In Florida it flowers in March, and in Mississippi and Tennessee in May and June. Its stem is twining, smooth and glabrous; its leaves are opposite, perennial, lanceolate, entire, dark green above, paler beneath; with short petioles.

The flowers, which are esteemed poisonous, are yellow, about an inch long and half an inch wide at the top, of a fine yellow color, and have an agreeable odor, which perfumes the air when they bloom. It grows luxuriantly, climbing from tree to tree, forming a delightful shade. According to Eaton, from whose botany we glean part of the above botanical notice, there is a variety called *inodorum* which has scentless flowers.

The Gelseminum is indigenous to the Southern States, and its beauty has caused its introduction into the gardens.

Medical properties and uses.—The root is the part used, and the tincture is the preparation most usually employed, and, as made, must be a saturated tincture. The roots, in a green state, well bruised, are introduced into a suitable vessel, and covered with *whiskey* or diluted alcohol. After standing two weeks, the tincture is separated by expression and filtered. It has a dark red color, and a pleasant bitter taste. The dose is from ten to fifty drops. The following account of its medical properties and affects is taken from a paper in the "Eclectic Medical Journal," August 1852, page 353, by F. D. Hill of Cincinnati:

"Gelseminum is stimulant, tonic, and anti-spasmodic. By its relaxing effect it produces gentle diaphoresis, and is said to be *narcotic*. Its effect in large doses, or doses too frequently repeated, is extreme relaxation, and general prostration of the whole muscular and nervous system. It will suspend and hold in check muscular irritability and nervous excitement with more force and power than any known remedy. It is of a pleasant bitter taste, and performs its wonder-working cures, in all febrile diseases, without exciting either nausea, vomiting, or purging. When enough has been given to produce its specific effect, the eye is dimmed, the vision clouded and double, the head light and dizzy. When these effects follow the administration of this remedy, no more should be given until the patient has entirely recovered from its influence. 'It may be used in all species of fevers, nervous and bilious headache, colds, pneumonia, hemorrhages, leucorrhea, chorea, ague-cake, asthma, and many other diseases: but its efficacy has been most admired in all forms and grades of fevers.' It should always be used with great care and caution. The root is said to possess a resinous principle, which, when extracted by pure alcohol, will produce death in very small doses. But no such effect need be expected from the proper dose of the common tincture. There is danger of carrying it to such an extent as to suspend involuntary muscular action,

and when this is the case, death must ensue. 'It is incompatible with no known substance, and may follow any *preceding treatment with perfect safety.'* The dose is forty drops for an adult, and children in proportion to age and temperament. It is given either with or without quinine. It has been used alone for *chronic rheumatism*, in doses of forty drops, three times a day, with marked effects. Three or four doses, with a mild cathartic, will remove the redness and swelling attending inflamed sore eyes. Special attention should be directed to the general health and constitution of the patient before giving gelseminum. If the bowels be constipated they should be moved by a gentle aperient, and kept in a relaxed condition. It requires double the quantity to produce the effect on some that it does on others; and should the practitioner ever produce too great a degree of relaxation, he should lose no time in stimulating and toning up his patient."

The alleged effects of this plant on the human system, taken in connection with its medico-botanical relations, mark it out as being probably one of the most valuable of our indigenous remedial agents, and render it well worthy of the investigation of regular physicians.

ON THE GRADUATING OF HYDROMETERS.

By W. H. Pile, M.D.

Having been requested to graduate some hydrometers as standards, in which the degrees of Beaumé's scale should correspond to the specific gravities as proposed by Mr. H. Pemberton (see Amer. Jour Phar. Jan. 1852) and sanctioned by the Philadelphia College of Pharmacy, I prepared for that purpose, by means of the Sp. Gravity bottle, a series of liquids of densities corresponding to every ten degrees of Beaumé's scale. Subsequently, however, upon reading over an article on hydrometers (Booth's Cyc. of Chemistry,) and making a few experimental trials, I have ascertained that hydrometers can be graduated to any degree of accuracy required, without the necessity of using the Specific Gravity bottle, and involving the use of pure water only. Believing that this method will prove serviceable to any one wishing to engage in the manufacture of hydrometers, I offer the following plain and practical

directions, by which a careful workman will be enabled to graduate his instruments without being obliged to resort to standards, the accuracy of which he has no means of determining.

1st. For liquids lighter than water.

According to the well-known hydrostatic law, " A floating body always displaces its own weight of the liquid in which it swims," the weight of any liquid which the hydrometer displaces is, therefore, equal to the weight of the hydrometer. From this fact the following proportion is deduced: As the weight of the liquid on trial is to that of water or unity, so is the original weight of the hydrometer to its required weight. The sp. grav. corresponding to 20° B. Pèse esprit, being ·93333, we have, as ·93333 : 1 : : weight of hyd. : required weight of hyd.$=(\frac{1\times \text{wt. of hyd.}}{\cdot 93{,}333})=$ weight of hyd. × 1·071428, and by subtracting the original weight of hyd. from this amount, there remains weight of hyd. × ·071428 (.071 nearly) as the weight required to be added to sink the hydrometer to 20° B., and the same amount for every other ten degrees successively. This is conveniently done, and the instrument graduated in the following manner: Having fastened in the stem of the hydrometer a slip of paper of the exact weight of the intended scale, and divided accurately for its whole length, into spaces as small as possible and numbered, immerse it in pure water at the temperature of 60° Fahr.; then add mercury or fine shot until the instrument sinks to the place intended for the commencement of the scale. Next dry the hydrometer carefully, and weigh it. Then immerse it again in the water and observe the division on the scale where the surface of the water cuts the stem —this will be the zero point or 10° Beaumé. For each succeeding 10° Beaumé drop into the hydrometer a quantity of mercury, found by multiplying the original weight of the hydrometer by ·071, as above shown, and reading off the divisions to which the stem sinks successively. If the stem was perfectly cylindrical, the 70° Beaumé could be ascertained at once by adding the requisite weight (wt. of hyd. × .071 × 6) and the intermediate space divided equally into 60 parts. The hydrometer is, lastly, to be emptied and its original weight made up; the true scale is then to be finished by withdrawing the graduated slip and marking off the observed numbers for every ten degrees; the intermediate degrees are then divided off, the scale fastened in its correct place and the stem hermetically sealed.

2d. For liquids heavier than water.

The specific gravity corresponding to 10° B., Pèse acid being 1.07407 + we have the following: as 1.07407 : 1 :: wt. of hyd., required wt. of hyd.=wt. of hyd. × ·9310346 +, and by subtracting this from the original wt., there remains wt. of hyd.×·0689654* +, or ·069 nearly, for the amount to be withdrawn, to enable the stem of the hydrometer to rise to the 10th degree of Beaumé. The hydrometer in this case must be made to sink to near the top of of the stem, which of course will be the zero point or 0° Beaumê; then by successively taking out the proper quantity of mercury, as shown above, (wt. of hyd. × ·069) the divisions, corresponding to each 10° B., are noted down as the stem rises. In practice it will be found much more convenient to get the 70° B. first by taking out seven times the above quantity, and then by restoring successively the seventh part of the amount taken out, to mark the divisions as the stem sinks. The scale is then to be finished as usual.

Hydrometers can be graduated in a similar manner, for showing directly the specific gravity of any liquid, by using the following formula: Weight of the hydrometer when sunk to the proper depth, divided by the specific gravity required, the quotient will give the required weight of the hydrometer; if this is less than its actual weight, the difference is to be withdrawn; if greater, the difference is to be added. It will be necessary, as the degrees will vary unequally, to determine the divisions of the scale for every 5, 10 or 20 grs. (water reckoned 1000) according to the accuracy required.

It will be evident that alcoholometers and others of a similar character, can readily be graduated by the same formula, marking off the specific gravities corresponding to each per cent. of alcohol. As the percentage by volume and percentage by weight varies considerably, it should always be stated on the scale which of the two the instrument is intended to indicate.

PHILADELPHIA, N. E. corner Passyunk road and Catharine street.

* The ratios which the excess or deficiency bears to the original weight of the hydrometer gives the modulus of the scale as recommended by Mr. Pemberton: thus for the Pèse acid 1 ÷ ·0689654 + =145, and for the Pèse esprit 1 ÷ 0·714285 + =140.

ON SYRUP OF ASSAFETIDA.

By Richard Peltz.

(From an Inaugural Essay.)

Assafetida has long held a high rank as an antispasmodic and expectorant, but has not been used as extensively as its virtues seem to demand, both on account of its very unpleasant odor and acrid bitter taste. It consists chiefly of resin, gum and volatile oil.

The Pharmacopœia of the United States recognises as officinal two fluid preparations of assafetida—the tincture and the mixture. These, although very good preparations, are both objectionable on account of their unpleasant taste. This, I think, could be remedied in part by making a syrup; with which purpose I have undertaken a number of experiments, to ascertain if a preparation could not be made which would contain in a more agreeable form all the medicinal properties of assafetida soluble in water.

Having tried a number of methods I concluded that the following formula would make the most perfect preparation:

Take of	Assafetida	an ounce,
	Boiling water	a pint,
	Sugar	two pounds.

Triturate the Assafetida in a mortar with a portion of the boiling water until an uniform paste is formed, then gradually add the remainder of the water, strain and add the sugar, applying a gentle heat to dissolve it.

Much heat should be avoided in forming the syrup, as the volatile oil, which is present in considerable proportion in good assafetida, (nearly 6 per cent.) a portion of which is dissolved or held in suspension by the water, would be dissipated.

There is an advantage in using boiling water, as it takes up more of the gum-resin, which is permanently dissolved or held in suspension by the sugar.

This syrup, when first made, is nearly white, but upon exposure to light gradually assumes a pinkish tinge. It is of the same strength as Mixture of Assafetida of the Pharmacopœia, and owing to its being more pleasant to the taste, might with

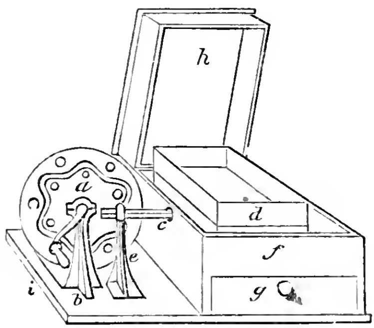
advantage be given as a substitute for that preparation, especially in cases of children, as the sugar conceals much of the unpleasant acrid taste of the assafetida.

This syrup is much more permanent than the mixture, having kept some for several months without any apparent change, except in color, owing to the action of the light on the resin; while the mixture kept in the same situation became very unpleasant in a short time. It also has an advantage over the tincture in being entirely free from alcohol, which sometimes is objectionable.

PHARMACEUTICAL APPARATUS.

By the Editor.

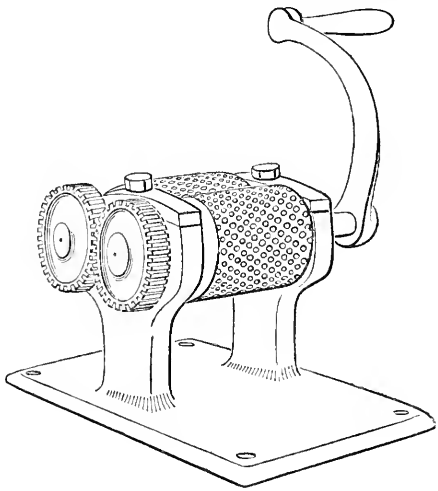
Swift's Patent Seive.—On a former occasion, (vol. xviii. 255,) we described a mill intended for the apothecary's use, laboriously and disagreeably effected in the mortar, might be accomplished with comparative facility and comfort. We have now to notice a sifting apparatus by the same inventor, (see figure,) intended as an adjunct to his mill, but which will be found useful on many occasions when the mill is not needed. It consists of an iron wheel, axle, and crank, *a* having an eccentric groove sunk into one of its sides so as to present six wave like depressions and elevations. The



wheel is firmly supported by the cast-iron standard *b*, on a stout wooden base *i;* another iron standard *e* supports in a smooth groove, and against the wheel, the end of the horizontal iron bar *c*, from which an iron pin projects into the groove of the wheel. The other end of the bar passes through the side of the box *f*, and is pinned to the square seive *d*, which works smoothly in a hori-

zontal direction on ledges within the box; g is a drawer beneath to catch the powder as it passes, and h a tightly fitting cover, which prevents the escape of dust without impeding the motion of the sieve. It will be at once perceived, that on turning the crank, the horizontal bar will be forced back and forth by the zig zag direction of the groove, which motion it communicates to the sieve; each revolution of the crank causing six distinct jerks of the sieve. There are seives of two or three sizes, so as to yield powder of different degrees of fineness.

Rotary Pill Machine.—This apparatus is intended as an expeditious means of making quantities of pills. It consists essentially of a pair of rollers of equal diameter moved towards each other, above, by accurately made cogs attached to the end of each by means of a crank attached to the axel of one of them. The surface of each roller is penetrated at regular distances with hemispherical cavities, arranged with mathematical precision, in such a manner that when the



rollers press together, each successive row of cavities meets the corresponding one on the other roller, so that at the point of contact a row of spherical moulds is produced. The rollers are supported firmly on a cast-iron base and supports. The rollers are approximated, when required, by lateral screws passing through the sides of the supports not seen in the figure. In using this machine the pill mass should have a uniform consistence of a certain firmness, not too tough or adhesive. It should be formed into ribbon-like strips, about one-eighth of an inch in thickness, and while one person turns the crank, which requires a considerable degree of force, another feeds the rollers as they gradually draw in the

mass, and clear the moulds of such pills as adhere. We are informed by Charles Ellis & Co., who are the agents for both of these machines, that the patentees are about to modify the rollers so as to make pills of three sizes. The chief difficulty in using the machine appears to be in getting the mass of such a consistence that the pills can be easily disengaged from the matrices, which are slightly greased. The necessity of using oil will be an objection to its use in some cases, but perhaps soap or some other substance will answer; our experience with the apparatus is too brief to venture an opinion.

INK FOR THE MILLION.

To the Editor of the American Journal of Pharmacy:

The following formula for making a *very superior* ink is not generally known. The facility of its preparation and its almost incredible cheapness (about two cents a gallon,) render it worthy a place in your Journal.

℞ 12 oz. avoird. Ext. Logwood
½ oz. " Bichromate Potash
5 gallons water;

Dissolve the ingredients separately in water and mix them together, in a short time the ink will be fit for use.

An analysis of the above would be very desirable.

As an instance of the very great coloring property of hæmatoxylon, I have found that 1-100th of a grain dissolved in 4,000,000 times that quantity of water, will be tinged a fine pink color by the addition of a little aqua ammonia.

Yours truly,

W. H. Pile.

Philadelphia, Sept. 13, 1852.

Note by the Editor. As Dr. Pile's formula appears to be based on that of Professor Runge, noticed on a former occasion, we will annex some observations on Runge's ink, taken from the *Pharmaceutical Journal*, Aug. 1852, page 71:

"*Professor Runge's Writing Fluid.*—One of the least expensive formulas for the manufacture of a writing ink, is that given by Professor Runge,

who says: 'I have for some time endeavored to find a black fluid possessing the properties of forming no deposit, of adhering strongly to the paper, of being unaffected by acids, and lastly, what is of great importance, not acted upon by steel pens.

'After many experiments, I have succeeded in obtaining a composition of the kind required, very simple in its preparation, containing nothing but logwood, chromate of potash and water, and free from vinegar, gum, copperas, blue vitriol, and even nutgalls. The low price of this writing fluid is also in its favor. It is prepared by simply adding one part of chromate of potash to 1000 parts of decoction of logwood, made by boiling twenty-two pounds of logwood in a sufficient quantity of water to give fourteen gallons of decoction; to this decoction, when cold, the chrome salt is gradually added, and the mixture well stirred. The addition of gum is injurious. In the preparation of this ink, it must be remembered that the yellow chromate and not the bi-chromate of potash is employed, and great care is required to ensure the due adjustment of the relative proportions of the ingredients used. The best way is to make a decoction of logwood, and *gradually* add to it, well stirring the mixture, as much solution of chromate as will give the shade required.

'It appears astonishing what a small quantity of the chrome salt is required to convert a large quantity of decoction of logwood into a black writing fluid; the fact is, however, certain, and care must be taken not to allow the proportion of chrome salt to exceed half a part for each 500 parts of decoction of logwood, as a larger quantity exercises a prejudicial effect in destroying the coloring matter of the liquid, whilst in the proportion above mentioned, a deep blue black writing ink is formed, which, unlike the ink made with tannogallate of iron, is perfectly fluid, forming no deposit. This writing fluid possesses another advantage; the paper which has been written upon with it may be washed with a sponge, or be left twenty-four hours under water, without the writing being effaced. Weak acids do not destroy the writing, nor do they even change the shade, while that made with gall-nuts is effaced, and the ink prepared with logwood and copperas is turned red.

'New steel pens are coated with a greasy substance, which prevents the ready flow of the ink; this should, therefore, be removed previous to use by moistening the pens with saliva, and then washing them in water. The application of an alkaline solution is still preferable to effect the removal of this greasy matter. This cleansing of the steel pens is absolutely essential in the case of using the ink above mentioned. I have used this ink upwards of two years, and my steel pens are not in the least degree affected. No rust is formed on the pens, so that after years of service the only wear experienced is that from constant use on the paper, thus rendering unnecessary the use of pens tipped with iridium and other hard substances.'"

PHARMACEUTICAL NOTICES—CIRCULATORY DISPLACEMENT.

By Joseph Laidley, of Richmond, Virginia.

Circulatory displacement was brought to the notice of American pharmaceutists several years ago, through Mr. Alsop,* of London, as applicable in the preparation of *infusions;* subsequently Dr. Benton suggested the feasibility of applying the same principle in preparing *tinctures;*† but the process is so little resorted to by our profession, that I would again call attention to it.

It possesses no advantage over percolation, where this process *can* be employed; there are some substances, however, which cannot easily be exhausted of their soluble matters by percolation alone, it is for these that circulatory displacement is especially applicable.

Professor Procter has already pointed out the advantages it affords in dissolving salts, especially those that undergo change when submitted to the prolonged action of the atmosphere and heat, as, for instance, protosulphate of iron.‡

The gum for syrup of gum arabic may be very rapidly dissolved *without heat* in this way. It is only necessary to tie the gum in a bag made of gauze, cambric, or some similar fabric, and suspend it just below the snrface of the water contained in a specie jar. On a recent occasion I arranged, on the night of Saturday, 16 oz. (Troy) of gum in half a gallon of water, and on examining it early on the following Monday morning the gum was all dissolved.

This process may be advantageously employed in dissolving sugar in preparing syrups; especially for those where a high temperature is injurious, as in some of the syrups of fruits, I have employed it very successfully. It has also the advantage of obviating the scratching of the sides and bottom of the syrup pan, so often produced by the sugar when rubbed against them by the stirrer. When preparing syrups in this way the kettle should be tall, and of small diameter—tinned iron answers well—the sugar, in grains or crushed, should be suspended at the surface of the liquid in a coarse flannel bag, secured at the top to a strong hoop.

* Am. Journ. Ph., viii. 89.

† Mohr, Redwood and Procter's Pharmacy, pp. 238 and 267.

‡ Am. Journ. Ph., xvi. 313.

It may also be employed in making tinctures of the resins and balsams, especially of the soft ones, tinctures of assafetida, tolu, compound benzoin, &c., &c., may be easily prepared in this way, using a wide mouthed bottle, and securing the bag to the cork by means of twine or wire. It is the most satisfactory method of preparing paregoric—the solids are placed in the bag and suspended in the mixed liquids contained in a bottle—for this purpose the opium should be in *coarse* powder.

To prepare laudanum, as well as many other preparations, where ordinary displacement is inconvenient or troublesome, the following plan is pursued:—say one gallon of laudanum is wanted, I take 10 oz. (Troy) of coarsely powdered opium, and having introduced half a gallon of diluted alcohol into a specie jar, suspend it just below the surface for twelve hours, it is then carefully packed in a percolator, covered with sand, and the half gallon of liquid from the jar is made to percolate through; diluted alcohol is next added until the filtered liquid measures one gallon. As thus prepared, laudanum (if good opium be used,) is of full strength; the last portions of liquid that come through have hardly any color and possess but very little taste. One gallon of laudanum may in this manner be prepared in twenty-four hours, and is more nearly perfect than that afforded by any other process with which I am acquainted.

To prepare wine of colchicum seeds, the latter are macerated for twenty-four hours in wine, they are next bruised thoroughly and treated as in making laudanum. But it is unnecessary to multiply examples, one of the above mentioned methods will be found applicable in almost, if not every case, where simple displacement cannot be conveniently employed. The advantages they offer over maceration are too obvious to require further recommendation, and I will only express the hope that pharmaceutists will more generally avail themselves of such simple and easy methods of extracting the medicinal properties of such drugs as they will answer for.

REVIEW.

DIE LEHRE VON DEN CHEMISCHEN ARZNEIMITTELN UND GIFTEN; IHRE EIGENSCHAFTEN, ERKENNUNG, PRÜFUNG UND THERAPEUTISCHE ANWENDUNG. Von Dr. ADOLF DUFLOS, Ausserordentlichem Professor der Chemie an der Universität zu Breslau, Administrator der Königlichen Universitäts Apotheke daselbst, Vice Director des nord-deutschen Apotheker-vereins, etc. Zweite Ausgabe. Mit besonderer Berücksichtigung der neusten Pharmacopoeen. Breslau.

CHEMICAL REMEDIES AND POISONS; THEIR PROPERTIES, RECOGNITION, TESTS, AND THERAPEUTIC APPLICATION. By Dr. ADOLF DUFLOS, Adjunct Professor of Chemistry in the University of Breslau, etc. Second Edition. With special reference to the latest Pharmacopœias. Breslau. 704 pp. octavo.

The rapid progress of modern chemistry may be in a great measure attributed to the arduous research, and the many discoveries of startling brilliancy which characterized the declining years of the last, and the earlier portion of the present century. More recently, rapidity of development has been quite as remarkable; and, as the science becomes more complete, it naturally becomes more diffused, and more universal in application. Consequently, we now make distinctions which in former years would have been impracticable. Thus, we have chemical works with various titles, indicative of what special branch they may expound; on theoretical and practical chemistry, for instance, on animal, and agricultural chemistry, and also on chemistry applied to most of the arts and manufactures. Although pharmaceutical chemistry has by no means lagged behind other branches, its literature, so far as the English language is concerned, is meagre, and has not flourished in a ratio corresponding with its increasing elevation and practical importance. This is particularly observable in the paucity, or rather absolute want of proper text books on the subject.

In regard to pharmacological chemistry, or that branch which considers the properties and uses of chemical remedies, if indeed, in its usual acceptation, the term does not also include the practical or pharmaceutical department, the same cannot be said, since

no small portion of all our materia medicas must necessarily be devoted to observations on chemical remedies. Leaving, for a moment, all other works out of the question, every apothecary has a complete digest of such information, and also much that is strictly pharmaceutic in its character, in what was long since the *sine qua non* of an American pharmaceutical establishment, the United States Dispensatory. There is no doubt, however, that a work which would in a certain degree comprehend both branches of the subject, and yet be sufficiently general and elementary in its details to form a text-book adapted alike to students of pharmacy and medicine, could not but be well received.

Of such a class is the volume before us. Germany, indeed, appears to be favored in this respect. Works on pharmaceutical chemistry and on chemical pharmacology abound. Dr. Duflos, our author, has published a number of books, all more or less connected with the subject. The work under consideration consists of improved editions of two previous publications, bound in one, yet retaining their distinct characteristics, being paged separately, and having different registers of contents. As now published it consists of four parts. The first part, originally issued under the title "Pharmacological Chemistry," was designed, as we are informed by its title page, "as a text book, and for the use of practical and judicial physicians and surgeons."* It contains one hundred and seventy for the most part closely printed pages, and resembles our own text books of general chemistry; the brief notices of preparations, however, and the attention to points of interest and importance to pharmaceutists and physicians, wherever such reference may be indicated, give it a technical appearance.

The first fifty pages are devoted to the fundamental principles of the science. The difference between organized and inorganized bodies is explained; then heteromorphism, isomorphism, absolute and specific weight, the combining proportions, chemical symbols, and so on, are duly considered. But little is said of light and heat, beyond noticing the light and heat capacity, and the influence of the latter on cohesion, and on the forms and properties of bodies. Electricity and magnetism are entirely omitted. With

* Practical physicians are those who have received the degree, and who have also passed through the ordinary hospital course. The judicial physician is a post somewhat similar to that of our coroner.

us, since lectures on chemistry usually embrace these subjects, a treatise on that science, be it ever so brief, cannot well omit entering in full upon them, or at least considering them in their connection with chemical phenomena. In Germany, we presume that students are left to obtain the necessary information while prosecuting the study of physics, for which, in the larger universities, a distinct professorship exists. Matters pertaining to operative chemistry, such as solution, evaporation, fusion, etc., are then briefly explained; after which follows a list of the chemical equivalents, and a valuable comparative table of the various medicinal weights in use in the various German states, and in foreign countries. The gases, and such of the other non-metallic elements as are important in a pharmacological point of view, are then considered. Here the arrangement of the author is comprehensive and peculiar, and, indeed, not without advantage, since his classification allows him to bring in, arranged in proper groups, according to their ultimate constituents, not only the inorganic compounds, but also the azotized and non-azotized organic bodies. Students are thus enabled more easily to comprehend and recollect the relationship which may exist between one group and another. The rest of this division is taken up with outlines of the metals; since the major portion are officinal, they are mostly referred to the second part.

The second part considers only chemical remedies. The acids, ethers, alkaloids, alkaline and metallic salts, together with such of the distilled waters as may involve chemical principles and changes in their preparation, are treated alphabetically and in a methodical manner. The synonyms, outlines of preparation, properties, various means of recognition, tests for impurities, and therapeutic application, are severally discussed under distinct heads; to which is added, if the substance under consideration be a poison, its antidotes and other points of toxicological importance. The Latin nomenclature adopted by our Germanic brethren differs slightly from our own. For instance, Aqua calcariæ Chinium sulfuricum; natrium-stibato-sulfuratum, or sulpho-stibiasnatricus, if there be a choice. Among the synonyms of tartarus boraxatus is given tartras-borico-natrico-kalicus; these compound terms, however, belong to a bygone period. The German itself is not unfrequently quite as formidable. Take as a specimen:

Salpetresaure Quecksilberoxydutflüssigkeit—although when this is translated into every word that it expresses—solution of the nitrate of protoxide of mercury—it is really no longer than the corresponding English.

The third division is devoted to chemical analysis. It comprises reagents, analytic instruments and apparatus, general directions for testing medicinal substances, remarks concerning chemical poisons and the manner of conducting judico-chemical examinations, together with the mode of analysing milk, blood, urine and urinary calculi. Those chemical substances which from their destructive action on the living organism have been classed among the poisons, the author divides as follows: 1. The so-called mineral acids, together with some of vegetable origin (oxalic, for instance.) 2. The alkalies. 3. The caustic alkaline earths, (caustic lime, etc.) 4. Hydrocyanic acid. 5. The organic alkalies, (from opium, the strychneæ and strychnoids.) 6. Many preparations of the metals, (preparations of copper, lead, arsenic, etc.) 7. A few salts, comparatively inert in small portions, but not without risk in large quantities, (hydrochlorate of ammonia, nitrate of potassa.)

The *modus operandi* of poisons, their antidotes, and the means by which they may be detected in organic mixtures, are matters which although they may perhaps belong more especially to the province of the physician, are nevertheless of much importance to pharmaceutists. The unrestrained and too frequently indiscriminate sale of the most virulent poisons, and the numerous cases of poisoning, either by accident or design, which must necessarily follow, render us at any moment liable to be called upon for assistance at times when chemical knowledge and coolness of judgment are absolutely necessary for the relief of the unfortunate sufferer. Consequently it is incumbent upon every pharmaceutist to be prepared for such emergencies.

The fourth part, termed a Hülfs-Register, is the Index. The Latin, French and German terms used in the work are separately arranged.

We are tempted to take advantage of the opportunity to remind our junior readers of the propriety of acquiring a sufficient knowledge of the German language to make use of the many scientific works with which it teems. Independent of the pecuniary ad-

vantages which may at any time result,—independent, also, of the fact that it tends to make one to a certain extent familiar with the authors and polite literature of a great people, a circumstance which of itself should be sufficient to induce any one to devote, for a time, his leisure hours to its acquisition,—there is to the pharmaceutist the perhaps still more important consideration, that it opens to him a new field of established and current scientific literature, the variety and extent of which but little idea can be formed by the uninitiated. Time so spent will not be regretted. J. S. K.

NOTE ON THE PREPARATION OF BESTUCHEFF'S TINCTURE.

By Fr. Mayer,

Pure sesqui-chloride and proto-chloride of iron are unknown to the Pharmacopœia of the United States, a fact which seems strange to a German pharmaceutist, since they are met with in every German dispensatory, and require great care for their proper preparation.

The American Pharmacopœia indeed recognizes a tincture of of chloride iron, prepared by dissolving the sub-carbonate (sesquioxide) of iron in hydrochloric acid, and adding alcohol. This tincture would be rejected throughout Germany, since they endeavor there to obtain the preparations of proto-chloride of iron free from any traces of sesqui-chloride, while those of the sesqui-chloride should contain no admixture of the proto-salt. This shows the practical character of the American Pharmacopœia, which does not demand of the apothecary a purity of preparation which it is next to impossible to meet.

While making this acknowledgment, a good formula for the preparation of sesqui-chloride of iron still remains desirable. This drug, too, is sometimes used in American practice, as may be seen from the "Notes on Pharmacy," by Mr. Benjamin Canavan, in the May number of the *New York Journal of Pharmacy.* Mr. Canavan has given one of the oldest formulæ from the Austrian Pharmacopœia of 1820, as found in the *Pharmacopie Universelle* by Jourdan. This formula directs us to dissolve the iron in a kind

of aqua regia, and then to evaporate the superfluous acid by means of a sand bath. The sesqui-chloride thus obtained is employed in the preparation of "Bestucheff's tincture," by dissolving one ounce of it in an ounce of water, adding twelve ounces of ether and agitating, then decanting the ethereal solution, and finally mixing it with four times its bulk of alcohol.

Having had frequent occasion to prepare this tincture as well in Germany as in this city, it may not be unsuitable if I give here the formula for its preparation, which seems to me the most convenient, as well as my reasons for thinking so.

The sesqui-chloride of iron may be obtained in a pure and neutral state by passing a current of chlorine gas through a solution of proto-chloride of iron, until a solution of the red ferrocyanide of potassium of Gmelin no longer produces a blue precipitate, and then evaporating the solution by means of a water bath. In this manner the salt can readily be obtained in a crystalline form. One ounce of the crystals thus obtained is to be dissolved in twelve ounces of ether, if we retain the alleged proportions, mixed with four times its bulk of alcohol, and finally bleached by exposing it to the direct line of the sun.

The Prussian Pharmacopœia of 1846 gives the following proportions:—One drachm of the sesqui-chloride of iron, or two drachms of the aqueous solution, one fluid ounce of ether, and three fluid ounces of alcohol.

Here we have to notice,—1st, That it is preferable to take ether and alcohol by weight rather than by measure, since their volume is very much influenced by the temperature, which may range from 32° to 60° or 80°.

2nd, That the sesqui-chloride, prepared with nitro-muriatic acid, is not so easy to obtain in crystals, in consequence of the adhering nitro-muriatic acid, which is always retained in small quantities. On the other hand, by drying the salt you will, in almost every case, spoil a quantity of it by driving off too much of the acid.

3rd, That the sesqui-chloride of iron, if in crystals, is easily and wholly soluble in ether, while the aqueous solution of it is but partially so, a portion being decomposed, as is evidenced by the solution becoming muddy. The ethereal solution, if prepared in the last mentioned manner, must be of uncertain strength, which is avoided by the first.

In Europe Bestucheff's tincture is much used by physicians. It sometimes agrees better in the bleached state, sometimes when colored. When first prepared the tincture has a yellow hue, which it loses by exposure to the light of the sun. If, after it has thus been bleached, it is placed in a dark closet, it again becomes yellowish, though the color is not so deep as at first.—*New York Journal of Pharmacy, August*, 1852.

SULPHUR IN PYROLIGNEOUS SPIRIT.

By Reuben Phillips.

During the course of some recent researches, I was occasionally perplexed by the anomalous appearance of sulphur; and the following experiments were made to ascertain its source. As I cannot find that any one has yet noticed the existence of sulphur in pyroligneous spirit, perhaps these experiments may be acceptable to those who use pyroligneous spirit for fuel.

About 6 grs. of hydrate of soda were placed in a silver crucible, capable of containing about $1\frac{1}{2}$ oz. of water. The soda was then fused, and the crucible inclined in various positions so as to line it with soda. The spirit to be tested was placed in a glass spirit-lamp holding nearly $\frac{3}{4}$ of a volume ounce,† and then the flame was driven into the crucible by means of a blowpipe, which was fed with air from a metallic vessel in which it had been strongly condensed. After the lamp-full of spirit had been thus burnt and the crucible had become cool, sufficient water was added to dissolve the saline matter; the solution was then filtered, an excess of hydrochloric acid added, and then a little chloride of barium. All the samples of pyroligneous spirit which I have obtained, when treated by this process, afforded an abundant precipitate of sulphate of baryta.

I satisfied myself, by a number of experiments with alcohol, that the process would not yield sulphur unless sulphur existed in the products of the combustion of the spirit.

† To prevent obscurity and circumlocution, I use the term *volume ounce*, or *vol. oz.* as equivalent to the *volume of an ounce of distilled water*.

12 vol. oz. of nearly colorless pyroligneous spirit were mixed with 20 oz. of water. After some hours the mixture was thrown upon a filter; the fluid that passed was scarcely at all milky, and but little troubled by a further addition of water. By this treatment nearly 5 vol. drms. of a slightly yellowish oil were separated. The filtered fluid was now rectified by a continued fractional distillation, and I thus obtained $5\frac{3}{4}$ vol. oz. of perfectly colorless pyroligneous spirit, having a specific gravity of about 0.867. This spirit was now mixed in a retort with powered chloride of calcium; on cooling, a thick mass was obtained intermixed with clear fluid. I did not saturate the fluid with chloride of calcium, thinking that an excess of chloride of calcium might render the separation of the sulphur compound more difficult. The retort was then placed in a water-bath. The distillation proceeded rapidly for a few minutes, but soon became very slow; the heat was, however, kept up for about $2\frac{1}{2}$ hours; $2\frac{1}{2}$ vol. oz. were obtained. 2 oz. of water were now added to the materials in the retort, and the distillation continued; the second product amounted to 7 vol. drms.

The product of the first distillation, namely the $2\frac{1}{2}$ vol. oz., on being tested, gave as much sulphate as so much crude spirit. The second quality, namely the 7 vol. drms., gave about a third of this quantity of sulphate of baryta. It now follows that the sulphur compound of pyroligneous spirit is not separated with the oily matter; and also, it may be confidently predicted, that the spirit can be obtained free from sulphur by a continued repetition of Sir R. Kane's chloride of calcium process.

An attempt was made to separate the sulphur by distilling pyroligneous spirit from a mixture of hydrate of potash and oxide of lead; but the distilled fluid contained as much sulphur as ever.

Sulphur can also be found in pyroligneous spirit by decomposing it in a retort with strong nitric acid.

A mixture of pure lamp-black and hydrate of soda, placed on a platinum capsule, and ignited for about twenty minutes by a lamp fed with pyroligneous spirit, gave rather a strong reaction of sulphate of soda. Consequently it is necessary to regard this source of sulphur in the incineration of organic matters.—*Chem. Gaz. July* 1852.

ON THE TINCTURE OF OPIUM.

The Pharmaceutical Society of Antwerp has employed a commission composed of its members to determine the best menstruum for the preparation of tincture of opium. It has arrived at the following results:

1. Good opium gives, when treated with water, less extract than bad or adulterated.

2. By warm digestion, a stronger solution is obtained than by cold infusion.

3. Alcohol must be preferred to wine in the preparation of tincture of opium.

4. Narcotine, although alone insoluble in water, becomes partially extracted with the other ingredients of opium. When it is advisable to avoid the removal of narcotine, proceed as follows: Treat carefully prepared aqueous extract of opium with boiling alcohol; this dissolves out the narcotine and morphine, from which solution, when cold, the narcotine separates.

After the precipitation, whatever ingredients are necessary to form the tincture are to be added to the alcoholic solution.

By this opportunity, the commission recommend another process by which morphine may be more readily separated from narcotine. One part of the opium is to be treated with four parts of alcohol. After the alcohol has been separated by filtration, the residue is again to be macerated with three parts of alcohol. The resulting tinctures, after being mixed, are to be set aside for twenty-four hours to allow the narcotine to separate; afterwards the morphine is to be precipitated with ammonia. To remove the last traces of morphine, the fluid from which the precipitated morphine has been filtered, is to be kept in a warm place for two days, a little water having been previously added, when a fresh quantity of morphine will fall down. By this method, one-twelfth of the weight of the opium employed, can be obtained as morphine.—*Annals of Pharmacy and Chemistry and N. Y. Jour. Pharm.*

ON THE CAMPHOR-TREE OF SUMATRA.

By Dr. W. H. De Vriese,
Professor of Botany in the Royal University of Leyden.

For many years past a distinction has been made between the Camphor-tree of Sumatra and Borneo, and that of Japan and China. The Japan or Chinese Camphor-tree is *Laurus Camphora*, L., belonging to the Laurels. It is a large and sometimes very thick tree, and may be recognized at first sight by its shining triple-nerved leaves. The camphor is partly obtained from this tree by incisions in the trunk, the juice that streams out being gathered in bowls. This method produces the purest camphor. Another kind is obtained by decoction and distillation of the wood in an iron pot,, furnished with a cover, or covered with another oblong iron pot filled with straw or reeds. The camphor is sublimated by an elevated temperature, adheres to the straw, and and is exported to Europe in slices. Formerly, the camphor was only refined in Holland; the process is now known elsewhere also. This is the camphor commonly sold in Europe, and is generally of a low price. Several other plants, chiefly of the Order *Labiatæ—Mentha, Salvia, &c.*—contain camphor, but in a small quantity. The camphor of Sumatra and Borneo, as well as the tree producing it, was always supposed to differ from that of Japan and China. At a remote period it was thought to be more precious and more medicinal than that of Japan, and at the present day the camphor of Sumatra is sold at a very high price, particularly to the Chinese; that of Japan and China, on the contrary, may be purchased at a low price.

The most varying accounts of the history of the Camphor-tree of Sumatra are given both by earlier and more recent authors. Some of these notices may be considered as entirely contrary to the truth, others are inaccurate, and very few are exact. The examination of them all would occupy too much time.

The Camphor-trees of Sumatra and Borneo were mentioned in the latter part of the sixteenth century. The first mention of it occurs in the "*Eerste Scheepvaart der Hollandsche natie naar Oost-Indië*, 1595—7," to be found in "*Begin en Voortgangh van*

de Vereenigde Geoctrijirdee O. I. Compagnie; gedrukt in den jare 1646."

What is told us of this tree by Valentyn, in the year 1680, is in many respects remarkable, and proves at the same time, how much the tree was already considered worthy of attention. Mich. Bern. Valentyn gives the following statement on this subject, which was in 1680 communicated to him by Arent Sylvius:—

"The Camphor-tree is found in several forests. Without any culture or human aid, it grows luxuriantly like other forest-trees, and elevates its lofty, heavy, unbranched, and straight trunk, and forms a crown of moderate extension, but which may be called small in proportion to the trunk, and which is furnished with few and not heavy branches.

"The leaves are oblong ovate, with a strong, lengthened point ('apice prolixe extenso.') In a dry state they are of a dark green color. They are hard, tough, and smell like camphor. This is said of the tree of Baros, for in that of Java (that is, of Japan,) the leaves are differently formed and much larger than those of the tree first mentioned, as may be seen by the seventh plate of Valentyn.

"The bark is fine and reddish; when the tree becomes old and thick, it falls off in large pieces; by this property the tree may be partly distinguished from others. Roots several feet in length are also often to be seen above ground.

"The fruit, which is obtained with difficulty in consequence of the heighth of the tree, resembles more a flower than a fruit, as it has more or less an oblong and thick variously-colored leaves, which are generally red, violet, yellow or greenish, and enclose the fruit like a hazle-nut. The fruit has a hard shell; the enveloping leaves are elevated above it, and are not pointed, but have red tips, spread out above like the petals of a tulip. The fruit, which, like the leaves, has a taste of camphor, is not only useful for medicinal purposes, but may be employed as food, and, like many other fruits, makes a good confection. The fruit is not easily obtained, as it is dangerous to penetrate the woods.

When the tree has attained some size, the resin does not stream out like benzoin; but near the pith, or heart, are natural fissures,

in which the juice accumulates, which, gradually coagulating, sticks to the wood in the form of small pieces of camphor.

"If those who have the care of the Camphor-trees, perceive that in some of the trees there is camphor, (which they pretend to discover by some signs known to them,) they order the trees to be cut down, strip them of their leaves and bark, and cut away the outer wood to the marrow or heart, in which are the apertures or fissures; they cut that wood into small pieces, and therein the camphor is found, beautifully brilliant. They have a method of scraping it from the wood with small instruments; and after purifying the scraped-off camphor (*camphora abrasa*) they seldom obtain more than from two to three pounds. Of that, one-twentieth is generally paid as a tribute; the rest remains in their possession.

"Camphor-oil, the peculiar juice of the tree, exudes from its fissures and cavities, and is carefully collected. The oil is so fine, that a paper penetrated by it and held near a flame, catches fire immediately and burns till all the oil is consumed. Oct. 2, 1680." *

We must not omit to mention that Valentyn † has given a drawing of the leaves of the Camphor-tree of Baros, which agrees very well with the objects before us, so that we do not doubt that Arent Sylvius, from whose accounts this chapter is written by Valentyn, really knew the tree, and in what respects it differs from that of Japan.

I would recommend further the notices given of this tree by Breyne,‡ Grimm, § Rumphius, || Miller,¶ Adolph Eschelskroon,**

* Valentini, *India Literata, seu dissertationes epistolicæ de plantis, &c.*, p. 488. Francof, 1716, fol.

† Mich. Bern. Valentini, *Hist. Simpl. Reformata*, lib. ii. sect. iv., p. 250.

‡ *Prodr. fasc. Pl. rar.* 1680.

§ *Obs. de Arb. Camphoræ, in Miscell. Cur. sive. Ephem. Nat. Curios.*, 1783, p. 371, tab. c. f. 33.

|| *Herb. Amb. Auct.*, cap. lxxxii., p. 67. 1755.

¶ Extracts from several letters from Mr. Charles Miller, giving some account of the interior parts of Sumatra.—*Phil. Trans.*, vol. lxviii, p. 161, 170. 1778.

** *Beschr. van Sumatra, insonderheid van desselfs Koophandel. Door Ad Eschelskroon*, p. 61, 63. 1783.

Rademacher,* Houttuyn,† Gærtner,‡ Colebrooke,§ Roxburgh,|| and William Jack.¶

I will here repeat the diagnostic description given of this tree elsewhere, founded upon specimens from Sumatra, collected by Dr. Junghuhn.

DRYOBALANOPS, *Gærtn.*, *Colebr.*, *Jack.*

Calyx inferus, monophyllus, cupulatus, limbo demum 5-alato, alis patentibus. *Corolla* infera, 5-partita (vel 5-petala, petalis basi junctis), laciniis ovato-lanceolatis. *Stamina* hypogyna, plurima, monodelpha, annulo in basi corollæ inserta; antheræ subsessiles, biloculares, elongatæ, lineares, loculis membranaceis, mucronatis. *Ovarium* superum, ovatum, stylo post anthesin sæpe persistente acuminatum, triloculare, loculus biovulatus. *Stylus* filiformis, staminibus vix longior. *Stigma* vix distinctum (nec capitatum).. *Capsula* unilocularis, trivalvis, monosperma, calyci aucto partim insidens, partim ejus, laciniis auctis alæformibus cincta. *Seminis embryo* exalbuminosus, inversus, cotyledonibus inæqualibus carnosis chrysaloideo-contortuplicatis.—Arbores *excelsæ Sumatram insulam hibitantes*, foliis *alternis coriaceis;* stipulis *caducis;* floribus *paniculatis, terminalibus et axillaribus.*

Dryobalanops *Camphora*, Colebr.; foliis ovatis obtuse acuminatis basi-acutis superne nitidis dorso apacis parallele venosis carinatis.

HAB. Region. 1-000′; prope Tapanuli et Huruba.

SYNONYMA.

De Arbore Camphoræ litera Wilhelmi ten Rhyne ad Jacob Breynium: Prodr. ej fasc. rar. plant, Gedani, 1683.

Arbor Camphoræ, Grimm, Observ. in Miscell. Cur. sive Ephem. Nat. Curios. 1683, p. 371, cum tab. fig. 33 (mala).

Arbor Camphorifera, Valentini, Ind. lit. p. 488, 1716, ex auctoritate Arent Sylvii.

Arbor Camphorifera, Mich. Berhn. Valentini Hist. Simpl. Reformata, lib. ii. sect. vi., p. 250. Rumphii Herb. Amb. Auct. cap. lxxxii., p. 67. 1755. Ch. Miller, in Phil. Trans. vol. lxviii., p. 1, pp. 161, 170, 188.

* *Verhand. van het Bataviaasche Genootschap*, vol. iii., p. 27. 1785.; vii. *Batavia*. 1814.

† *Verh der Holl Maatsch van Wetense*, pl. vii. 1784.

‡ *Suppl. Carpol.*, vol. iii. p. 49.

§ *Asiatic Researches*, vol. xii., p. 537. 1818.

|| *Flor. Ind.*, vol. ii., p. 617. 1832.

¶ Hooker's *Companion*, vol. i., p. 253. 1835.

Lauras foliis ovalibus acuminatis lineatis, floribus magnis tulipaceis, Houttuyn, Nat. Hist. ii., 2, pp. 318, 319; Verh. Holl. Maastch. van Wet. xxi. 272.

Dryobalanops aromatica, Gærtn.? Suppl. Carpol. vol. iii. 49.

Dryobalanops Camphora, Colebr., Asiatic Researches, vol. xii., p. 537, 1818.

Dryobalanops Camphora, Colebr. in Jack's Descr. of Malayan Plants Hook. Com. vol. i., p. 253. 1835.

Shorea Camphorifera, Roxb.? Fl. Ind. vol. ii., p. 517. 1832.

Pterygium teres, Correa? Ann. du Mus. vol. x., p. 159, t. 8, f. 1.

Dryobalanops Camphora, Colebr. in Hayne's Arzn. Gew. xii., 17.

Dryobalanops Camphora, Colebr., Korthals, Verh. over de Nat. Gesch. der Oost-Ind. Bezitt. (Kruidk.) p. 45.

ADUMBRATIO.

Arbor 100′; trunco valido, stricto, columnæformi, 60′–70′ alto, 11′ crasso, ad basin expansionibus laminaribus, radiantibus instructo: cortice exteriore ibidem fisso, scabro, strato resinoso, splendente, partim albo flavescente, sæpe crasso, pelucidoque irstructo; sursum fusco, demum in ramis ramulisque e griseo-fuscescente obtecto. Lignum ipsum fuscum.

Folia alterna (nec opposita), petiolata; petiolis dorso rotundatis, superne sulcatis, sæpe curvatis vel inflexis et ramis accumbentibus, 0,01–0,02 longis, immo longioribus; ovatis, basi acutis, apice subito angustatis, obtuse acuminatis, margine integerrimis, versus apicem subundulatis, utrinque glabris, coriaceis, superne nitentibus, medio sulcatis, dorso opacis carinatis, parallele venosis, demto petiole 0,06–0,07 longis, et 0,33 fere latis.

Stipulæ germinatæ, subulatæ, caducæ (Colebr.); ovatæ acutæ, (Korth.); in speciminibus Junghuhnianis nullæ. An forsan omnes lapsæ?

Pedunculi axillares et terminales, breves, incrassati.

Calyx (junior non visus) adultus auctus, hemisphæricus, campanulatus, basi lignosus, admodum crassus; interna structura magnum referens numerum lacunarum aërearum, in quinque excrescens alas foliaceas, coriaceas, rigidas, erectas, patentes, reflexas, sinu exciso rotundato amplo a se invicem distinctas. Alarum formæ et diametri diversæ sunt pro diverso evolutionis stadio; in fructibus immaturis magis sunt elongatæ, et versus medium et apicem dilatatæ, 0,07 longæ et fere 0,01 latæ (spec. Houtt. et Jungh.) et in illo stadio quoque erectæ; in maturis (Colebr.) contra magis dilatatæ, vere spathulatæ, reflexæ. Structura alarum est parallele nervosa et inter nervos, reticulata. Calyx totus terebinthinam redolet.

Carolla (secundum specimen lectum a Millero fil. et nobiscum communicatum ab Ill. Rob. Br. ex Mus. Brit. Lond.), caduca, monopetala, 5-partita, laciniis, ima basi inter se coalitis membranaceis, 0,015 longis, 0,004 latis, lanceolatis.

Stamina in fundo corollæ annulo proprio dentibus triangularibus acuti, erectis instructo insidentia, numerosa. In specim. Mill. 15 numeramus sed plura lapsa sunt. Filamenta brevissima; antheræ biloculares, introrsæ, in dorso linea media (connectivo) in mucronem ultra loculos elongata notatæ; loculi membranacei, tota longitudine dehiscentes, marginibus loculorum involutis.

Capsula glandem quercinam simulans, supera, ovata, stylo coronata, lignosa, fusca, externe striis longitudinalibus tenuibus prædita, basi cupula rotundato-gibba hemisphærica excepta, eique firmiter adhærens, unilocularis, trivalvis, valvis æqualibus crassis, monosperma, 0,035 longa, 0,015 lata, (Colebr.), 0,03 longa, 0,015 lata (Gærtn. si eadem est ejus species quæ, Colebrookii, quod incertum.)

Semen solitarium, magnum, cavitati capsulæ respondens, ovato-oblongum, antice sulcatum, integumento fusco ad sulcum intus flexum, et cum columna centrali colliquescens. Columna centralis e fundo cupulæ calycinæ oriunda, ad verticem adscendens, semen in illa directione in duos dividens lobos dorso connatos, inde aucta; lobis longitudinalibus, mollibus, columna brevioribus, intra cotyledonum plicas sese demergentibus; duobus majoribus lateralibus ad ventrem recurvis; duobus minoribus dorsalibus citra axem productis divergentibus .Gærtn.)

Albumen nullum.

Embryo constans 2 cotyledonibus, carnosis, imparibus. Externus maximus, seminis formam constituentibus; interior multo minor, lateralis, subcochleatus. Plumula simplex, conica, diphylla. Ridicula longa, sursum directa, in sulco cotyledonis externi contenta, apice conico obtusiusculo terminata, adscendens, supera. (Juxta spec. Marsdeni Mus. Brit. Londinensis et descript. Cel. Gærtn.)

The tree here described belongs to the Natural Order *Dipterocarpeæ* (Bl. Lind.) All the trees belonging to this family are gigantic and of a majestic appearance, and are chiefly remarkable for the beautifully colored and winged fruits. All of them contain more or less of a balsamic resin. *Shorea robusta* produces a resinous substance which is used at the religious solemnities of the Indians. *Vateria Indica* yields a resin which in India is used as copal, and is known in Europe as *anime*-resin. The Javanese species of *Dipterocarpus* are all resinous, and the resin is said to be used as copaiva-balsam.

The camphor-tree is one of the loftiest of the Indian Archipelago. In its dimensions it surpasses even the rasamala-tree (*Altingia excelsa*) of Java. It is the giant among the trees of the East Indies. Its trunk rises vertically, and divides into branches only

at the top, forming a somewhat convex crown. A person looking over the tops of the trees from an elevated place, for instance, from the mountains behind Loemoet, at a height of from three to four hundred feet, can, without difficulty, count the full-grown camphor-trees that are scattered in the forest; for, while the *Anonaceæ*, *Acacias*, *Fagræœ*, and figs, which compose the chief mass of trees in those forests, are eighty or even a hundred feet high, the camphor-tree, with its gigantic crown, is seen rising fifty or even a hundred feet above them, as the steeples of churches appear above the roofs of the houses in a town. The following are its dimensions, compared with those of the rassamala (*Liquidambar Altinghiana*):

	Thickness of the trunk.		Length of the trunk.	Diameter of the crown
	Beneath.	Above.		
Camphor-tree	7–10 feet	5–8 feet	100–130 feet	50–70 feet
Rassamala	5–7	3–5	70–90	40–50

Near the ground the Camphor-tree gives out radiating extensions of the trunk and root, such as several travellers have represented in their descriptions. At the lower part of the tree the bark is rugged, with fissures, and often covered with a resinous and glittering, sometimes yellowish substance, which is transparent, and consists either of camphor or of camphor and its peculiar resin. Higher up, the bark is of a dark grey color, here and there covered with lichens, but not with *Lianes*, like so many other trees.

The position of the leaves is alternate, as shown in the drawing of Houttuyn. Colebrooke describes a branch without fruits, *with opposite leaves*. Has *Dryobalanops Camphora* sometimes a position of leaves such as Colebrooke describes? We can scarcely doubt the accuracy of his descriptions—they have too much the appearance of truth about them; and all that he has communicated of the tree and of the substances which it produces, gives us the conviction that M. Colebrooke must have had specimens

of this tree; we are not, however, certain of the correctness of his figure.

The leaves seen by us differ from those of Miller's specimens, which we saw in 1850 in the British Museum, (which are much larger,) and from those of Colebrooke's drawings and descriptions; the largest leaves of the latter being 0,175 long, and 0,05 broad. But this difference is perhaps explained by ours being smaller because they are on flower-bearing branches. They most resemble the description given by Houttuyn.

Most authors speak of stipules (Colebr. Korth.) We have not seen them, and suppose that our specimens have lost them; we must therefore refer our readers to what the two last-mentioned botanists have written on the subject.

The calyx has many modifications in the form of its base and wings, as well as in the direction of those wings, which are sometimes nearer to each other, or more modified or reflexed. The great diversity which we have observed in our specimens persuades us that there is no reason for accepting more species. Colebrooke has seen and drawn objects in full growth. In the different states of developement in which we saw this calyx, we always found natural cavities in its tissue, chiefly in the woody part. In the interior it is resinous, and emits a smell of turpentine.

We have not space for further descriptions of the crown, the stamens, and the fruit. The albumen seen by us was in some of Marsden's specimens in the British Museum, preserved there in spirits; it agrees entirely with the figure and description given by Gærtner. In the specimens at our disposal, which were not preserved in spirits, the albumen was consumed. For these specimens we are much indebted to the liberality of Mr. Robert Brown. Through lack of young specimens, the structure of the ovary has been till now but imperfectly known. The reason is, that naturalists have not had the opportunity of getting specimens at the time of the devlopement of the flowers.

Dryobalanops Camphora, Coleb. must be the plant mentioned by Grimm, Rhyne, Valentyn, and Rumphius. It is the same as that mentioned by Miller, and which M. Rademacher presented to Houttuyn. It belongs undoubtedly to the same genius as

Gærtner has represented as *Dryobalanops*, but it is doubtful what he means by his *D.aromatica*, which he says occurs in Ceylon, and yields the best cinnamon. Here may be an error. The uncertainty is increased by his not giving characters of the species; and the identity with the species of Colebrooke cannot be decided. There seems to be some mistake in the account of Gærtner, for no *Dryobalanops* has ever been found in Ceylon, and it is impossible that a *Dryobalanops* should produce cinnamon, and that even the best in Ceylon. Perhaps he was misled by inaccurate statements on the labels of some of Sir Joseph Bank's specimens. Hitherto our efforts to arrive at some certainty in this case have been unsuccessful. If it be decided that the plant mentioned by Gærtner is the same as that of Colebrooke, then, according to the opinion of some botanists, there would be a reason for adopting the name *D. aromaticæ* of Gærtner, instead of that of Colebrooke. But, first, that reason does not yet exist; and we think that we should maintain the system established among botanists, that no priority can be given in science to a name of a plant unaccompanied by a description. It is possible that Gærtner had the description of his species in manuscript, but he did not publish it. *Shorea*, Roxb. and *Pterygium*, Corr., have been described later than Gærtner's *Dryobalanops*, and must therefore be represented here as synonymous.

Geographical Distribution.—The region in which the camphor-tree is found, extends, in latitude, from Ajer Bangis to Singkel, or nearly from 1° 10′ to 2° 20′ N. It is not met with more southward than Ajer Bangis; whether it grows further north than Singkel is unknown (Jungh.) Within these parallels it extends along the south-western side of Sumatra, from the coast to a considerable distance in the interior, and is found on the mountains as high as from a thousand to twelve hundred feet. As those mountain-chains which are near the coast, and most of the central valleys of the mountains which extend parallel to the coast, that is, in a direction from S. W. to N. E., are much higher than 1000 feet, it is clear that this tree has a very limited region, occupying but a small part of south-western Sumatra: it is also confined to the outer slope of the mountains, whence it descends into the alluvial plains, though it approaches the sea only in those parts where the ground

is not swampy. It is found most abundantly, and in the best state on the out-lying hills of the mountain-chain and on the lower slopes of the mountains themselves, at a height of from three to five hundred feet; and here the camphor is collected in the greatest quantity

The camphor-tree was seen by Dr. Junghuhn on the promontory of Caracara, near Telo; on the alluvial plain of Loemoet, on the mountains of Hoeraba, behind Sibogha; and on the ridges of hills in the south of Loemoet, &c. He found it growing on weather-beaten granitic and trachytic hills, on yellow-red clayey soil, abundantly furnished with oxide of iron, and also on a rich alluvial soil abounding with humus.

Climate and Temperature of the region of the Camphor-tree.—On the coasts the mean annual temperature is but 80° (on the island of Java 82°,) and nearly 78° Fahr. at 1000 feet, the most elevated limits where the tree is still found, thus much lower than in Java.

There are two causes particularly, that bring about this depression of temperature: first, the narrowness of the level shore of the coast, immediately at the foot of high mountains; secondly, the uninterrupted dense forests, with which not only the mountain-chain itself, but the coast-plain is covered. These circumstances produce a greater humidity, and at the same time a greater coolness of the air, at an inferior elevation, than in Java.

At the eastern foot of the Sumatra mountain-chain there are extensive arid and barren plains, only overgrown with alang-alang (*e. g.*, at Pertibi.) Over the heated soil of these plains the air becomes extraordinarily rarified: the cooler sea-air rushes in, coming from the ocean on the western side of Sumatra, where the sea is deep, and where no land exists for a great distance; and a west wind arises, which, partly kept back by the obliquely situated mountain-chains, changes into a north-western one. This wind carries the humidity of the sea towards the mountains, by the summits of which the moisture is soon condensed and changed into clouds. These, during the whole year, at intervals almost daily, at regular hours, but chiefly in the afternoon, shed heavy showers over the land, while the thunder roars in the mountains. The dampness of the air is then so great, that mist and clouds are for many days seen hanging immoveably even over the woods of the lower coast-lands. Frequently, too, the wind blows by reverber-

ation, in an opposite direction, like a hurricane, from the mountains to the coast.

Thus the camphor-tree grows in a very changeable and generally moist climate, where extreme states of heat and coolness by storm quickly follow each other. About eleven in the morning, in the serenest weather, there is frequently an oppressive warmth, while at noon heavy showers, driven on by a north-west wind, and accompanied by thunder and lightning seem to cover the land.

Surrounding Vegetation.—One consequence of the unsettled character of the climate, of the low elevation of the clouds, and of the cooler temperature in general, is the occurrence of some trees and plants near the sea-coast, which in Java are met with only at a greater height. Thus the camphor-trees grows often in company, not only with species of *acacia, anona, michelia,* and *dipterocarpeæ,* but also with oaks; and it is found with marsh *casurinæ,* with the Nipong Palm (*Oncosperma filamentosum,*) and with benzoin-trees. Amidst the underwood of the forest are seen species of *melastoma, elettaria,* and other *scitamineæ,* with *Vitex trifoliata* (which occurs most frequently,) and several species of *rubus.* These plants are seldom found in Java below 3000 feet.

Signs of the presence of Camphor in the tree.—According to the observations of Dr. Junghuhn, the young trees do not contain camphor. The inhabitants of the Battalands are accustomed to cut the oldest and heaviest ones, although the age of the trees is not known; and in reference to a large camphor-tree which he saw near Tapanuli, the Rajah Ngabing told him, that his ancestors, as far back as the history of his family went, had known it of the same size. It was probably at least two hundred years old.

Camphor-oil and Camphor.—Camphor-oil, that is to say liquid camphor, occurs in all the trees, even in young ones, and exists in all parts of the tree, but most in the younger branches and leaves. The solid camphor is, however, found only between the woody fibres, and, therefore, only in the trunk. The natives do not know beforehand whether a trunk contains much or little camphor. If, however, there is a large quantity of camphor in the splinters or fibres of the wood, they decide that the fissures of the inner part contain a great abundance. When much gluey, half-solid young camphor shows itself on the radiating extensions, or in the fissures at the lower part of the trunk, they come to the same conclusion.

However, the results are frequently fallacious, and they often uselessly cut down trees which produce but very little.

Collection of the Camphor.—The process of collecting the oil and camphor from *Dryobalanops camphora*, was witnessed by Dr. Junghuhn, near Loemoet (Tapanuli,) in Sumatra, at an elevation of 300 feet. The greatest quantity of camphor, in a solid as well as in a young and liquid state, is brought from a height of 1000 feet. The solid camphor is obtained by cutting down the trees, in the inner part of which fissures are found between the woody fibres, which extend longitudinally, and are filled with camphor. The young trees do not contain that substance, while the thickest and oldest, that are most filled with it, rarely contain more than two ounces. The natives who are occupied in collecting the precious product, go in a number of twenty or thirty men into those parts of the woods where the camphor-tree is most often found. They commence constructing cottages, intending to encamp upon the spot for some months. One-half of the company is occupied with severing the trunk near the root, and not, as many others have said, at from fourteen to eighteen feet above the ground. The others are engaged in gathering the camphor from the trees which have been cut down. From the extraordinary thickness of the trunks, it often happens that a whole day is employed in fellinga single tree.

On his second expedition from Loemoet to Pertibi, in the year 1841, Dr. Junghuhn visited the bivouac of such a company in the neighborhood of Hoeraba, and by this means became acquainted with the method by which the natives obtain camphor or camphor-oil from the tree.

The oil is collected in the following manner:—

1. Incisions are made through the outer and inner-bark, at the lower part of the trunk close to the root, chiefly where the tree produces the before-mentioned woody radiations, which alternate with vertical cavities, which are also observed in other trees growing between the tropics. The clear, yellow, balsamic, oily juice, which is discharged very slowly, is collected in a half-cylinder of very thin bamboo, cut longitudinally. According to the observation of Junghuhn, who witnessed it, half a day was scarcely sufficient to half-fill a small tea-cup with this liquid, and even that small quantity was mixed with fragments of bark and other impu-

rities. The collected juice is purified by pouring it through a kind of sieve, made from the fibrous tissue of the sheathing footstalk of palm-leaf (*hindoe*.)

The camphor is found as a varnished, gluey, and clammy covering, resembling turpentine, or in a solid grainy state, in the fissures of the bark, and in the laminary prominences. The surface near the root has chiefly a white covering, which is rarely thicker than one or two millimetres. This substance is highly estimated by the Battas, and fetches a high price.

Colebrooke, and many other authors who have written on this subject, have said that the camphor is obtained from the middle of the trunk, and that every tree should produce a quantity of eleven pounds; the camphor being found in the heart of the tree in such a quantity as to fill a cavity of the thickness of an arm. This is quite exaggerated, and must be founded on an error. If it were true, the price of camphor would be lower than it is now. At Padang and at Tapanuli the price of a hundred pounds of camphor is nearly £250. Such a quantity would in that case be obtained from nine trees. That proportion is highly improbable, and suffices to show the inaccuracy of the account. On the contrary, the camphor only occurs in fissures of the wood, and the native of the Battas scrape it off with small splinters or with his nails.

2. By maceration and decoction of the branches and pieces of bark and wood, another liquor containing camphor is obtained, but still in small quantities, and much mixed with water. The wood is cut into small fragments, and the leaves are bruised and boiled with water in an iron kettle, at the time that the trunk is being cut down, in order to use the pieces in their fresh state. In boiling, an oily substance rises to the surface, which is taken off with the shell of a cocoa-nut cut in half and provided with a handle. The liquor is poured into a bamboo, and closed in with a stopple formed of *hindoe* fibres, and at the return of the expedition after many months it is poured into bottles. Dr. Junghuhn has two bottles filled with the liquid at the place itself.

After a long stay in the woods (frequently of three months) the company, consisting of thirty persons, departs. It frequently happens that during that period they fell more than a hundred trees, and yet they rarely take with them above fifteen to twenty pounds of solid camphor, worth £40 to £50.

Use and Price of the Camphor in Sumatra.—Camphor is here collected in a comparatively small quantity. While some thousands of quintals of benzoin are yearly sent into the European markets (*e. g.*, in 1837 three thousand,) but ten to fifteen quintals, and often less, are sent of Sumatra camphor. The price is £2 10*s.* a pound. It generally comes from Baros, whence the name of Baros camphor. From that place several cavarans set out yearly to collect this substance in the woods. The same product comes from Tapanuli, Natal, and Ajer Bangis. It is not exported, for it is collected for the use of the natives wherever the tree grows.

Besides the small quantity which is employed as a remedy against various diseases, we must mention here a particular use, by which a great deal of camphor is wasted, and its rarity and price much increased; and this lavish application of it, together with the slaughter of hundreds of buffaloes sometimes in one day, is one of the principal causes of the poverty of the Batta royal families (Rajahs.)

A very ancient custom prescribes, that at the death of a considerable person among the Battas, who, during his life, had a claim to the title of Rajah (sovereign prince,) rice be sowed in a sacred place, and that the corpse be kept above ground among the living till the rice has sprung up, grown, and borne fruit. Not before the rice is ripe and gathered in do they think it right to bury the corpse, and it is actually interred with the ears of the rice that was sown on the day of the decease. Thus the burial takes place after five or six months. (The remarkable ceremonies of such a funeral are elsewhere described by Dr. Junghuhn.) The corpse, like the rice-grain six months before, is then committed to the earth; and thus the hope is emblematically expressed, that, as a new life arises from the seed, another life shall begin for man after his death.

During the period previous to interment, the corpses are preserved in wooden coffins within the houses, the women wailing day and night. Trunks of *Durio Zibethinus* (the Durian) are hollowed out to contain the bodies. They are carved with much art, and have at the under part small apertures, through which the fluids may escape. The corpses contained in these coffins are not only spread over with pounded camphor, but entirely covered with it, in such a manner that all the space between the coffin and the

body is filled with it. This is the only means known to the inhabitants of the Batta-lands of preserving the bodies of their kings, without smell or corruption, during so many months, in the humid air of such a hot climate. Dr. Junghuhn saw a corpse which had been preserved in this manner during four months, and which was shrunk up like a mummy, and emitted no smell but the penetrating odor of the camphor.

In this way an immense quantity of camphor (a quarter to half a quintal) is consumed, for the purchase of which the family of the deceased king must make the greatest sacrifice, and often sell all their cattle. Every village has such a rajah.—*Lond. Pharm. Jour. July* 1852.—*from Hooker's Journal of Botany*.

ON COD-LIVER OIL.

By Dr. F. L. Winckler.

The constituents of genuine cod-liver oil, are, according to Dr. De Jongh's analysis:—

Gaduin? (a so-called organic substance)	Bilifulvin
Oleic acid - - - -	Iodine, Chlorine and Bromine
Margaric acid - - -	Phosphoric acid
Glycerine - - - -	Sulphuric acid
Butyric acid - - -	Phosphorus
Acetic acid - - - -	Lime
Fellinic acid - - - -	Magnesia
Cholic acid - - - -	Soda
Bilifellinic acid	

Hence, therefore, its composition would be quite analogous to that of the other fatty oils; but with the addition of small quantities of some of the constituent parts of the bile and also of iodine, bromine and gaduin. But my own investigations have led me to regard cod-liver oil as an organic whole, of a peculiar chemical composition, differing from that of all other fatty oils hitherto employed as medicines. I prove this assertion by the following facts.

1. If genuine cod-liver oil from Berg (the light clear sort) be saponified with potash, and the thus obtained and purified soap be decomposed bytartaric acid, we obtain oleic and an inorganic acid.

2. If a mixture, consisting of a solution of six parts of caustic potash, twenty-four parts of distilled water, and twenty-four parts of cod-liver oil, be left for several days standing at the ordinary temperature and frequently shaken, then diluted with twenty-four parts of distilled water, and distilled, the distillate possesses the most intense odor of cod-liver oil, and contains a considerable quantity of a peculiar organic compound: oxide of propyle.

3. If nine parts of cod-liver oil be saponified in a porcelain vessel, by five parts of oxide of lead in the water-bath, and the required quantity of distilled water added, the cod-liver oil is decomposed into oleic acid, an inorganic acid, and a new acid, namely, *propylic acid*. The greatest portion of this acid, as well as of the oleic and inorganic acids combine, as it appears, with the oxide of lead, to form a basic compound. Another, very probably, acid salt of lead, can be extracted from the plaster-mass by washing it with distilled water. Not a trace of the hydrated oxide of glyceryle is formed on this occasion. The mass smells very disagreeably of train oil and herring, and if exposed in very thin layers in the water-bath, to the influence of atmospheric air, it assumes a dark-brown color after the water is evaporated, at the same time the disagreeable odor for the most part disappears.

This colorization is a consequence of the strong tendency of the propylates to become oxidized, and by this to become dark. If the solution of acid propylate of the oxide of lead be treated with sulphuretted hydrogen, and the sulphuret of lead be removed, we obtain a perfectly colorless solution, which has a strong acid reaction, becomes colored by evaporation in the water-bath, loses the very disgusting odor of train-oil, and at last leaves an intensely brown colored residue. Exactly the same is the case with the watery solutions of the neutral propylates of baryta and ammonia. The perfectly neutral, colorless, but undecomposed solution of the ammoniacal salt smells of herrings, but that of the salt of lead smells like concentrated broth.

4. If a solution of cod-liver-oil-soap, prepared as stated in No. 3, be distilled in a suitable spacious distilling apparatus, with an addition of caustic lime and chloride of ammonium (in the proportion of six drachms hydrate of potash, three ounces of cod-liver oil, six ounces of water, six ounces of fresh burnt caustic lime, and

one drachm of chloride of ammonium,) with the precaution that the mixture of lime and chloride of ammonium be added to the soapy mixture previously introduced into the retort, so that the lime mixture be perfectly impregnated by the latter, the generation of hydrate of lime takes place upon the application of a slight charcoal fire, with a rather strong heat; at the same time a colorless liquid, clear, like water, is distilled over, and this is a *concentrated aqueous solution of propylamine*, without free ammonia. The crystallized sulphate of propylamine is easily obtained from this solution by saturating it with diluted sulphuric acid, and precipitating the resulting salt with spirit of wine.

This very simple experiment is sufficient to prove with certainty the proportion of the oxide of propyle in cod-liver oil; the propylamine possesses all the properties of that obtained from the brine of herrings or from ergot of rye.

Conclusion.—Cod-liver oil, when saponified with potash, yields oleic and margaric acids, and oxide of propyle; with oxide of lead it forms oleic and margaric acids and a pure highly oxidized matter from propyle, namely, *propylic acid.* In neither case of saponification *is the hydrated oxide of glyceryle* obtained; the *glyceryle* ($C_6\ H_3$) is replaced in cod-liver oil by *propyle* ($C_6\ H_7$). The generation of *propylamine* ($NH_2\ C_6\ H_7$), on the addition of ammonia, takes place only in cod-liver oil, and in no other officinal fatty oil, and its place in the Materia Medica cannot, therefore, be supplied by any other oil.

It is not my intention to draw, from these investigations, any conclusion as to the medicinal efficacy of cod-liver oil. I am not a physician; but when we reflect that the fat assimilated by the animal organism serves chiefly as a material for the process of respiration, the possibility of cod-liver oil undergoing during this process a decomposition similar to that which it undergoes by the influence of alkalies, is very plausible; and when we further consider that in such a decomposition, by the presence of the conditions requisite for the formation of ammonia, which, indeed, are never wanting in the animal organism, the formation of propylamine is highly probable, it is not surprising why cod-liver oil alone should prove so advantageous in many diseases, even exclusive of the slight proportion of iodine; and I think myself justified in concluding that the efficacy of this oil depends chiefly upon the

peculiar chemical composition which I have discovered; as propylamine, according to my experiments, is to be found also in the normal urine and sweat.

The importance of the small quantity of iodine contained in the oil I shall endeavor to determine by subsequent experiments; for the present I shall only observe that both the *oxide of propyle* and the *propylamine* are chemically very closely related to iodine, the first forming with it a compound (iodide of propyle,) similar to iodide of formyle (iodoform,) which becomes very easily decomposed.—*London Pharm. Journ.*, July, 1852, from *Buchner's Neues Repertorium fur Pharmacie.*, Bd. I. H ft. 4, p. 165.

PREPARATION OF PROPYLAMINE FROM ERGOTINE.

By Dr. F. L. Winkler.

The readers of the *New Repertory for Pharmacy*, part i., p. 22, already know that I have been for some time occupied with the investigation of ergot, and that I obtained, by the distillation of ergotine with potash, besides ammonia, a substance having a very unpleasant odor, which conducted itself as a volatile alkali, and possessed a narcotic and highly diuretic property. This confirmation of a result which I had obtained some years before, induced me to continue my experiments, and I have now arrived at the conviction that the volatile alkali which is extracted from ergotine by distillation with potash is propylamine ($N\ H_2\ C_6\ H_7$, or $N\ H_3\ C_6\ H_6$,) consequently the same which, according to the most recent experiments, is proved to be the product of decomposition of narcotine by potash, and the ingredient of herring-pickle. The smell itself made me imagine, long before I was acquainted with Wertheim's experiments, that herring-pickle must likewise contain propylamine, and my experiments have fully confirmed this supposition, for in distilling herring-pickle with potash I obtained the same propylamine as that extracted from a concentrated aqueous solution of ergotine. The properties in in which they agree are the following:—

1. Propylamine saturates acids completely, and thus forms salts soluble in water, and for the most part in spirit of wine,

with the exception of sulphate of propylamine, which does not dissolve in the latter. Beautiful white crystals may, however, be produced from the concentrated aqueous solution by the admixture or alcohol of eighty per cent. of strength. The salts of propylamine dissolved in water and treated with tannic acid, produce a white (flocculent) precipitate; with chloride of mercury likewise a white but pulverulent precipitate: with nitrate of silver a white (flocculent) precipitate; and with chloride of platinum a yellow precipitate (a crystalline powder.) The salts of propylamine have a strong odor of fresh ergot, much less of herring-pickle, and are easily decomposed by potash.

2. The concentrated aqueous solution being mixed with a fourth of its volume of tincture of iodine, a considerable dark yellowish-brown sediment is precipitated, and the supernatant fluid appears dark brownish-red. But in a very short time this sediment diminishes considerably, the fluid gradually changes color, so that in about twelve hours' time there will be left but very little orange-colored sediment, whilst the fluid itself will appear almost colorless. Immediately after the addition of iodine the very disagreeable odor of propylamine disappears, and the mixture acquires the odor of iodine.

3. When the neutral aqueous solution of sulphate of propylamine is evaporated in a water-bath it exhales a very disagreeable odor of herring, the solution becomes very acid, has only a weak odor of ergot, and all the reactions cease. If this concentrated solution be digested with caustic lime in a still, there comes over, without the aid of artificial heat, almost pure propylamine, which has the odor of an ammoniacal liquid, and produces all the reactions of pure propylamine.

Now the propylamine of ergot presents the very same results, and it is on this account that until lately it has always been mistaken for ammonia. I am convinced that it constitutes the odorous principle of urine, perspiration, and in the blood, and is often the cause of the odor which we observe in the action of alkaline lyes upon nitrogenous compounds. Propylamine belongs to the organic bases, and may be considered as the adjunct [*Paarling*] of ammonia. I think I am justified in concluding, from the results of my experiments, that propylamine, *combined with an acid*, pre-exists in ergot as well as in herring-pickle, and

is not produced by the potash, as is the case with narcotine. I have previously demonstrated the presence of formic acid in ergot, and it is with that acid that the propylamine seems to be united. I have not yet made any experiments with herring-pickle.

It will not now be difficult to determine whether the medicinal activity of ergot depends on propylamine or not, for the neutral salts of propylamine dissolved in water are easily absorbed, and I hope to be able to induce physicians to make pharmacological and therapeutical experiments.

I have reasons to suppose that propylamine is likewise an ingredient of cod-liver oil, and being easily combined with iodine, it may be soon ascertained by practical application whether it ought not to be considered as the bearer (*träger*) of iodine. I propose to begin the necessary experiments in this respect as soon as my apparatus is entirely free from the odor of propylamine, in order to avoid all error.

Finally, I had the idea of trying an experiment with regard to propylamine upon my own urine, which I made after a supper consisting of roast veal, potato-salad, and a glass of water, and which was neither acid nor alkaline. I poured three ounces of the urine, fresh made and still quite warm, upon four ounces of burned lime, and submitted it to distillation. The distilled product had indeed the odor of pure propylamine, and reacted strongly alkaline; but acted in a remarkable manner on tincture of iodine in the same way as liquid ammonia. After having neutralized it with sulphuric acid, the liquid showed, when tested with tannic acid and nitrate of silver, an unmistakable proportion of propylamine. Might this be formed out of the urea? My experiment confirms, at all events, the opinion stated above; the beginning is made, and I may now pass from experiment to scientific deductions.

Remarks by Dr. Buchner.—My friend, Dr. Winkler, in communicating the above paper, very agreeably surprised me by transmitting at the same time specimens of his preparations of propylamine, and that too in quantities varying from one to two drachms, for which I hereby beg to express to him publicly my best thanks. I received from him, namely:—

1. The rough product of distillation of herring-pickle.
2. The aqueous solution of the sulphate produced from it.

3. The pure crystallized and by spirit of wine precipitated sulphate of propylamine.

4. The concentrated solution of pure propylamine.

5. The aqueous solution of the sulphate prepared with No. 4.

Hitherto I have only experimented with the preparations No. 2, 4, and 5, in order to verify, and complete the statements of the above paper. All these solutions are quite colorless and clear, like water; they diffuse already at some distance a strong odor of herring; but the pure aqueous propylamine, when smelt at closely, has a pungent odor, very similar to that of liquid ammonia, which, however, at a distance assumes, as it has been said, the smell of herring. This odor is so peculiarly characteristic, that I do not doubt, that even in water-closets, in consequence of fermentation, propylamine is developed, particularly as woollen clothes easily acquire there the odor of herring. All the conditions at least necessary for the formation of propylamine, ammonia, and carbo-hydrogen, are to be found in water-closets. In a small close room its odor becomes insupportable, and affects strongly the head. Doctor Winkler had, therefore, good reasons to warn me against it. A young chemist, upon whose hand I dropped a very minute quantity of aqueous propylamine, for the purpose of ascertaining its taste, notwithstanding that he had been walking after that a considerable distance, and had been exposed to the air, smelt still, after some hours, so strongly of herring, that happening to enter a company, he was spoken to about it by several persons. I mention this merely as a caution. The taste of pure aqueous propylamine is pungently alkaline, and hardly distinguishable from that of caustic ammonia.

The chemical reactions of propylamine are well explained by Winkler. Turmeric paper turns brown with it, but being exposed to the air, in which propylamine quickly evaporates, it resumes again its primitive yellow color.

Sulphate of propylamine (No. 3) appears in small splendid white prisms; exposed to the air it evolves a distinct smell of herring, and has a pungent saline taste, like sulphate of ammonia; it is entirely neutral, and when moistened with water, it does not alter the color either of blue or red litmus-paper, or of turmeric-paper.

We have in solutions of silver and iodine, which are not pre-

cipitated by ammonia, very appropriate re-agents for distinguishing propylamine from ammonia. Propylamine, however, treated with sulphate of silver, gave me not a white, but a yellowish-brown precipitate; and this result suggested to me the idea, that formiate of propylamine might be present. This precipitate was easily and perfectly dissolved in caustic liquid ammonia. With an aqueous solution of iodine I acquired at one time, according to the quantitative proportion, a brown, and at another time a beautiful yellow precipitate, which dissolved in an excess of iodide of potassium. I usually employ an aqueous solution of iodine in iodide of potassium, instead of the tincture of iodine made with spirit of wine. The precipitate produced by iodide of potassium is, as I have just stated, either brown or yellow, provided that no excess of iodide of potassium be employed.—*London Pharm. Journal, July*, 1252, from *Buchner's Neus Repertorium.* Bd. 1.

RESULTS OF THE EXAMINATION OF SEVERAL PARCELS OF ALEPPO SCAMMONY.

By B. W. Bull, of New York.

Since the publication of an article upon Virgin Scammony in a previous number of this Journal, I have had an opportunity of examining four different varieties of scammony received from Constantinople, under the names, Aleppo Scammony, first; Aleppo Scammony, second; Tschangari Scammony, and Skilip Scammony.

No. 1. *Aleppo Scammony, first.* This occurs in large amorphous pieces weighing one or more pounds; is not covered with any calcareous powder. The fractured surface presents a dark greenish resinous appearance. The specific gravity will be found below. The caseous odor is not so decided in this specimen as in some of the other varieties, confirming, as will be seen from its composition, as adduced further on, the remark made in the article above alluded to, in regard to the insecurity of relying upon the odor as a means of judging of the quality of scammony.

No. 2. *Aleppo Scammony second.* Of this a sample of about one pound was received. This is in amorphous pieces; it differs from the previous specimen in its fracture which is non-resinous

and horny, it is of a much lighter color, and has a grayish tinge. The scammony odor is more decided. This variety receives the prefix *Aleppo* improperly, as it does not come from that locality, and is said to be made by pressing the root, though the quantity of insoluble organic matter which it contains, seems to indicate some other impurity, intentionally added.

No. 3. *Tschangari Scammony*, derives its name from the place of production. It appears to be a variety not found in market here. It resembles in fracture the last mentioned, and is, like that, in amorphous pieces. Its odor is more decided than that of any of the others.

No. 4. *Skilip Scammony*. This specimen appears to have undergone some deterioration, and evinces a disposition to mould. Some of the pieces are marked exteriorly, as if placed in a bag when soft, and dried in this way. It is destitute of the caseous odor, and has a mouldy smell. Fracture, non-resinous, and grayish, like the last mentioned varieties.

These three latter varieties are always to be obtained in Constantinople, we are informed, while the first quality Aleppo, is only produced in small quantity, and is soon out of market.

The difference in composition of the different varieties will be found annexed, the numbers referring to those given above. All of them indicate the presence of starch by the test with iodine.

	No. 1.	No. 2.	No. 3.	No. 4.
Specific gravity.	1.150	1.325	1.339	1.311
Resinous matter, water, and loss.	Per cent. 86.88	per cent. 55.42	per cent. 64.10	per cent. 34.00
Vegetable substance, insoluble in ether,	8.10	38.00	23.17	59.43
Inorganic matter,	5.02	6.58	12.73	6.57
	100.000	100.000	100.000	100.000

New York Jour. of Pharm. June, 1852.

ON SOME CONSTITUENTS OF SAFFRON (CROCUS SATIVUS).

By M. Quadrat.

The author prepared the coloring matter of saffron in the following manner:—The saffron was completely exhausted with ether, and then extracted with boiling water; the clear aqueous solution was precipitated with basic acetate of lead, the red precipitate which forms washed with water, suspended in water, and decomposed by sulphuretted hydrogen, and the precipitate well washed. The coloring matter was then extracted from the precipitate with boiling alcohol, the alcoholic solution evaporated to dryness in the water-bath, the residue treated with water, and the aqueous solution evaporated to dryness. The coloring substance thus obtained forms an aurora-red inodorous powder, which dissolves in water with a yellow color; the presence of a trace of alkali increases its solubility in a high degree. It dissolves readily in alcohol, but sparingly in ether. It is decomposed by strong mineral acids; from an aqueous or alkaline solution it is separated by dilute mineral acids in brownish-red flakes, but in an altered state; the organic acids, as tartaric, tannic and gallic acids, likewise cause the separation of red flakes. Dilute solutions of the alkalies readily dissolve the pigment, and acquire a yellow color. Concentrated solutions, at the temperature of boiling water, decompose the pigment; and on distillation, an oily substance passes over, which has a different odor from oil of saffron, is lighter than water, but after some time sinks to the bottom as a brownish mass. On heating the pure coloring substance to 248° F., it turns blackish-brown; at 302°, it becomes shining red; at 356°, red-brown, with tumescence; and above 392°. it is entirely decomposed.

This coloring matter contains no nitrogen. Dried at 212°, it furnished on analysis results leading to the formula $C^{20}H^{13}O^{11}$, viz.

	Found.	Calculated.
Carbon, - - - -	54·54	54·34
Hydrogen, - - -	5·96	5·88
Oxygen, - - -	39·50	39·82

A red compound with oxide of lead, formed by precipitating the aqueous solution with basic acetate of lead, furnished, when dried at 212°,—

Carbon,	21·81	20 =	21·55
Hydrogen,	2·31	13	2·33
Oxygen,	15·92	11	15·80
Oxide of lead,	59·96	3	60·32

The aqueous solution of the coloring matter gives with salts of copper a green, with lime or barytic water a yellow precipitate.

Saffron likewise contains a volatile oil, to which it owes its peculiar odor. On distillation with water, a yellow oil passes over, which is specifically lighter than water, has an agreeable smell, but after a short time forms a whitish mass, which sinks to the bottom.

On evaporating an ethereal tincture of saffron, a yellowish fatty substance is left behind, which on treatment with hot water yields on cooling a snow-white mass, the melting-point of which is situated at about 118°. It dissolves in boiling alcohol, from which it crystallizes in part on cooling.

Saffron also contains grape-sugar and an apparently new acid. On being burnt, it furnished 8·93 per cent. of an alkaline ash, which contained carbonic acid, sulphuric acid, silica, phosphoric acid, chlorides, lime, magnesia, potash and soda.—*Chem. Gaz. from Liebig's Annalen.*

ON THE OIL OF GRAIN SPIRIT, OR FUSEL OIL.

By Edward N. Kent.

The oil of grain spirit has recently attracted considerable attention from the fact of its being the basis of a number of artificial perfumes or essences, one of which has been extensively used under the name of banana or pear essence.

The crude oil, as is well known, consists principally of hydrated oxide of amyl, mixed with more or less acohol, and small quantities of other substances, the nature of which is not generally known, though it has been asserted that œnanthic ether and œnanthic acid may be found among them. To obtain the latter articles was a desired object, and that which led to the subject of this paper.

Crude fusel oil, (or the oil of grain spirit) when distilled in a glass retort, commences to pass over about 190° Fahrenheit, and considerable portion is obtained below 212; which consists mostly of alcohol and water, with a small quantity of the hydrated oxide of amyl. By changing the receiver and continuing the operation to about 280°, a large product is obtained, consisting principally of hydrated oxide of amyl, but contaminated with a little alcohol and water, and a trace of less volatile oil, which may be found in larger quantity in the residue remaining in the retort. This residue is small, of an ageeable odor, and consists of several substances among which may be found, an oil having the intoxicating smell, but not the chemical properties of œnanthic ether, other than a similarity in its boiling point.

To obtain a more perfect separation of the substances contained in the crude oil, a small copper still was constructed, on the principle which is now so successfully used in the manufacture of high proof alcohol, and which proved highly useful for the above purpose. This still is so arranged, that the vapor which is evolved by the boiling liquid, passes through a series of bent tubes, each of which is connected with a return pipe for returning vapors less volatile than boiling water, back to the still. These tubes are enclosed in a copper funnel filled with cold water, which becomes heated as the operation proceeds, and finally boils; the less volatile vapors are thus prevented from passing over, and the alcohol and water are almost perfectly separated from the oil remaining in the still. If the water is then drawn off from the vessel containing the serpentine tube, the distillation may be continued till it ceases spontaneously.

The product thus obtained, when rectified from a little dry caustic potash to remove coloring matter and acetic and valerianic acid, and again rectified from dry quick lime to remove water, gives pure hydrated oxide of amyl.

The residue left in the copper still is most easily obtained by distillation with water, containing a little carbonate of soda to neutralize free the acids contained in it. A small quantity of a yellow oil is thus obtained, having an agreeable vinous odor similar to œnanthic, but unlike that ether it yields fusel oil, instead of alcohol, when distilled repeatedly from caustic potash. It is

consequently an *amyl* compound, while œnanthic ether is known to be the œnanthate of oxide of *ethyle*.

The residue remaining in the still after the above distillation with water, consists of acetic and valerianic acids in combination with the soda, and the solution holds in suspension a considerable quantity of hydrated oxide of iron, which formerly existed in combination with the acids.

From the above statement it appears that crude fusel oil contains the following substances, viz:—

Alcohol,
Water,
Hydrated oxide of amyl,
Acetic acid,
Valerianic acid,
Oxide of iron.

And an amyl compound, analogous to œnanthic ether.—*New York Journal of Pharmacy, December* 1852.

ON THE SULPHURIZATION OF CAOUTCHOUC, AND ON SOME PROPERTIES OF SULPHUR.

By M. Payen.

The discovery in 1843 of the remarkable properties which are communicated to caoutchouc by a peculiar kind of sulphurization, called *vulcanization*, is generally attributed to Mr. Hancock.* It is only from this period that the applications of this elastic substance have become of considerable importance, and have given birth to several new branches of industry. In fact, since then the alterations produced upon the immediate principle, either by an elevation or decrease of the atmospheric temperature, have had no influence upon the vulcanized product. It preserves its suppleness and its elasticity below 32° F., and no longer becomes soft or adhesive above 95° and 104°; its temperature may even be raised beyond 212° without loss of that

*Incorrectly, we believe; the discovery is really due to Mr. Chas. Goodyear, of New York, U. S.—W. F.

tenacity which renders it so useful for certain purposes, for instance, for transmitting steam and the mechanical force by flexible tubes.

The principal conditions of success in this manufacturing operation had been carefully determined; in England, America and France, several methods had been successively imagined, which realized more or less perfectly the curious and important modifications of the sulphated substance; but it was not known in what the chemical reaction consisted; no one had an accurate idea of what is termed *desulphuration*. Lastly, it was impossible to understand, and consequently to prevent, certain alterations, especially the rigidity and fragility of several objects, after having served often but a short time the purposes for which they were made.

The investigations which I have the honor to bring before the Academy have had for their object to throw some light on these points of applied science. I shall first describe what takes place in one of the processes of vulcanization still employed by several manufacturers; it will then be more easy for me to point out the effects of other processes. If a strip of caoutchouc from two to three millims. thick is kept immersed for two or three hours in melted sulphur, at the temperature of 234–240°, the liquid will penetrate into the pores like water or alcohol, as we have already shown, but still more quickly, and the weight of the strip will have increased by 10- to 15-hundredths. The organic matter will have experienced no considerable modification in its properties; it can be shaped, and its recent sections joined, just as in the normal state; solvents will act upon it with the same force; but its porosity will be diminished. If the temperature be now raised to 275°, 302° or 320°, in any medium whatever, inert of itself, a few minutes suffice to effect the change. By prolonging the action of the temperature, the object in view would be exceeded, the product, gradually less supple and less elastic, would soon become hard and fragile. This last alteration would be still more marked if the caoutchouc were kept at the above temperatures, 275°–320°, in melted sulphur. The amount absorbed would gradually increase until it became in twenty-four hours, for instance, nearly equal to the

weight of the organic matter, or forming 48 per cent. of the stable compound.

From the commencement of the reaction of the sulphur at this temperature, and during the whole of the time it is continued, a slight but constant disengagement of sulphuretted hydrogen takes place.* Even the liquid sulphur at 302° absorbs, and is capable of retaining a volume of this gas nearly equal to its own. A curious phenomenon results from this fact; at the moment when the sulphur crystallizes, from the decrease of temperature, each crystalline particle liberates a bubble of gas; sometimes this is disengaged; sometimes, meeting with the crystals, it raises them and remains interposed, so that gradually the whole mass rises, and increases from 15 to 20 per cent. of its primitive bulk, instead of diminishing, as would happen in a normal crystallization of pure sulphur.

Instead of causing the liquid sulphur to penetrate at a temperature near its melting-point, the caoutchouc may be mixed by a mechanical roller with from 12 to 20 per cent. of its weight of sulphur in a state of fine powder; the properties of the organic matter are not altered, but can be modelled and joined together as in the normal state. But if the temperature is now raised to the point at which the vulcanization is effected, it takes place as in the first case; the suitable term would be equally exceeded under the same circumstances, and the alterations above mentioned would be likewise manifested.

Composition and Properties of the Caoutchouc vulcanized by the Methods above described.—When the suitable term has not been exceeded, the organic substance contains sulphur in two different states; from 1 to 2 per cent. is held in intimate combination;† the remainder is simply interposed in its pores.

* At the same time an equivalent quantity of an organic substance separates, which contains more carbon than the caoutchouc, and which can be extracted with a hot solution of caustic potash or soda, which does not act perceptibly upon the mass of the caoutchouc combined with the sulphur.

† This compound has not altered the relations between the elements of the organic substance which is represented by the formula $C^8 H^7$, as I have proved by several analyses made upon normal caoutchouc, or one of its two unequally soluble parts, and also on the compounds containing from 0·015 to 0·485 sulphur.

The uncombined excess of sulphur is gradually eliminated from the caoutchouc by the mechanical effect of the extension and contraction of the pores; this continues for several months. Several chemical reagents remove the interposed sulphur more rapidly and more completely, as hot solutions of caustic potash and soda (and even cold in the course of a month if renewed frequently), sulphuret of carbon, essential oil of turpentine, benzine, and anhydrous ether. These liquids cause the organic matter to swell to such an extent, that its bulk is soon increased eight or nine times.

Ether removes the sulphur in a peculiar manner. A small proportion is first dissolved, which is then carried to the exterior; there it separates in crystalline particles; other particles, successively dissolved in the interior, follow the same course, and increase the size of the crystals, which soon become pretty large, and are of the octahedral form. Neither turpentine nor benzine transfer the crystalline particles of the sulphur removed from the interior of the swollen mass to the exterior. This peculiarity appeared to me to be owing to the hitherto unobserved greater solvent power of the turpentine and benzine; in order to verify this fact, I saturated these two liquids, kept at a constant temperature of 167° F., in the water-bath with an excess of flowers of sulphur. The yellow solutions were immediately filtered, when they deposited crystals on cooling:—

	In turpentine.	In benzine.
The hot solutions contained	0·0587	0·0733 sulphur.
After cooling they contained	0·0135	0·0173 sulphur.

Moreover, the crystals were not similar; the turpentine, on slow cooling, as also on evaporation at 77°, had deposited the sulphur in small octahedrons; on sudden cooling, it deposited it in acicular prisms; in the benzine the crystals were prismatic. It is curious to observe this last mode of crystallization in a test-tube; a number of diaphanous rectangular plates are seen to form, ascend and descend rapidly in the liquid, and successively agglomerate at the bottom of the vessel in laminæ, which thus gradually lengthen; if, after cooling to 59°–60°, evaporation is allowed to recommence, a further crystallization takes place now in diaphanous octahedra, which attach themselves to the extremities of the opake yellowish lamellar prisms first formed. On evaporation with heat, long silky laminæ are obtained. A drop of the same solution in

benzine, placed on the object-bearer of the microscope, deposits on evaporation transparent octahedra.

100 parts of hot sulphuret of carbon dissolve	73·46	sulphur.
100 parts of cold sulphuret of carbon dissolve	38·70	sulphur.
100 parts of hot ether dissolve - -	0·54	sulphur.
100 parts of cold ether dissolve - -	0·188	sulphur.

On cooling, the sulphur crystallizes in large octahedra from sulphuret of carbon; from ether, in minute octahedra and some prisms.

Ether and sulphuret of carbon, kept for a long time in contact with vulcanized india-rubber, retain from 4 to 5 per cent. in solution, which may be isolated by evaporating several times, and each time removing by ether the free sulphur, and then treating with anhydrous alcohol, which removes from 1 to 1·50 per cent. of fatty matter. The caoutchouc thus extracted may be separated into two portions, one very ductile, which dissolves in benzine, and is deposited on evaporation; the other more tenacious, less extensible and insoluble. Both these portions come from the interior of the strips at a certain depth, where the combination is less intimate, and contains less sulphur than near the surface.

The want of homogeneity in the combination of the sulphur with the organic substance is greater in the two other methods of vulcanization, which I shall describe further on.

After vulcanization, the caoutchouc still consists of two parts, differing in cohesive power and solubility. This may be proved by keeping it immersed for two months in a mixture of 10 parts sulphuret of carbon and 1 of absolute alcohol. The dissolved portion consists of the interposed sulphur, which is removed after desiccation by a solution of caustic soda; the organic substance the least aggregated is then left as a translucid, yellowish, slightly-resisting mass. The undissolved portion is become more brown and less transparent. The following are the proportions obtained in the experiment, besides the fatty matter:—

Insoluble tenacious portion - -	65
Soluble soft portion - - -	25
Excess of sulphur - - -	10

Vulcanized objects, applied on metals, especially upon silver,

gold, copper, lead and iron, act by their interposed sulphur; they sulphurize more or less rapidly the metallic surfaces in contact with them. The washers placed between the flanges of tubes used for transmitting steam under a pressure of 4 or 5 atmospheres, which are exposed consequently to a temperature of 293°–308°, soon lose their elasticity and become hard and brittle, owing to the combination which takes place between the free sulphur and the caoutchouc. This is greatly avoided by desulphuration with caustic alkaline solutions, or by the use of a new method of vulcanizing, described at the end of this paper.

Some comparative experiments made with, 1st, *normal*, 2d, *vulcanized*, 3d, *desulphurated* caoutchouc, show that, on immersion for two months under similar circumstances, the absorption of pure water was for the first 0·200–0·260, for the second 0·042, and for the third 0·064. Some balloons, 2 millims. in thickness, filled with water, and submitted to a pressure which doubled their diameter, lost by continual transpiration in twenty-four hours, and per square metre, the normal caoutchouc 23 grms., the vulcanized 4 grms.

Similar balloons, filled with air under the same pressure, experienced scarcely any loss in eight days. The perceptible loss of water through a thin layer of caoutchouc will be readily understood; the liquid introducing itself by capillary attraction into the pores of the organic substance, and replacing in a continuous manner the quantities which evaporate at the external surfaces. That the air and gases in general do not behave in a similar manner needs no explanation.

The process of cold vulcanizing invented by M. Parkes consists in plunging the sheets or tubes of caoutchouc into a mixture of 100 parts sulphuret of carbon and 2·5 parts protochloride of sulphur; the liquid, penetrating into the organic substance, causes it to swell, and deposit sulphur, which unites with the caoutchouc, owing to the decomposition of the unstable compound which it formed with the chlorine. The superficial parts would be too strongly vulcanized, and would become brittle, if care were not taken to remove the objects after a minute or two, and to immerse them immediately in water, as recommended by M. Gérard. The chloride of sulphur is decomposed by its contact with water, while the portions which have penetrated further continue their sulphur-

izing action in the interior. This is an ingenious plan of regulating this kind of cold vulcanization.

Another process which appears preferable on account of the salubrity and regularity of the operation, is due to the same inventor; it consists of immersing in a closed vessel for three hours the objects to be vulcanized, in a solution of polysulphuret of potassium indicating 25° Beaumé, at a temperature of 284°, and then washing in an alkaline solution, and afterwards in pure water. In this manner the useful amount of sulphur is combined with the caoutchouc without an excess being left in its pores; and we thus avoid the inconveniences which result from the unequal sulphurization of the organic substance.—*London Chem. Gaz.*, May 15, 1852. from *Comptes Rendus*, March 29, 1852.

ON OXIDE OF ZINC.

By Dr. Wittstein.

Mohr (*Archiv der Pharmacie*, lxv., 137) has found that a full red heat is not essential for the complete separation of carbonic acid and water from the carbonate of zinc, but that a temperature of from 280° to 300° C. (= 536° to 572° Fahr.) suffices for their speedy and perfect expulsion. The operation can be performed in an uncoated glass alembic or porcelain dish. The preparation undergoes no change of color thereby (*i. e.*, it remains perfectly white, whereas, the over-heated oxide shows a trace of yellow.) We now observe that it has become very mobile, and no longer adheres to the capsule, but floats on a layer of carbonic acid and aqueous vapor.

If a glass flask be used, it must be half filled with finely pulverized* carbonate of zinc, and placed on a triangle not too near a gentle coal fire. As soon as condensation of watery vapor takes place in the neck of the flask, this is to be stopped with a piece of cloth, and gently shaken in a circular direction. Thereby those parts at the lower surface of the flask are mixed with the rest of

* This condition is essential to the success of the operation.

the powder, and other portions are transferred to the fundus of the flask, while the aqueous vapor is more quickly and abundantly disengaged and deposited on the neck. In order to remove this the more readily, a pair of small hand-bellows may be employed for the purpose of gently blowing into the neck of the flask. After repeated shaking the process is terminated. Its completion may be known by the circumstance of the powder no longer floating, as it were, on the surface of the stratum of vapor, but subsiding to the bottom of the vessel. A proof of the absence of carbonic acid may be found by placing the powder in a porcelain dish, and repeating the operation with a fresh quantity.*

The experiment and testing are more easily performed in a porcelain dish, as the shaking can therein be more exactly regulated. If the temperature be raised too high, the powder will be burnt yellow even under a red heat. This observation of the yellow discoloration from a pure white by irregularity of the heat, has led Dr. Wittstein to the consideration of the question, often discussed, of the cause of the yellow color of oxide of zinc prepared in the moist way. For this purpose he has instituted a series of experiments, and has shown, among other conclusions, that the adhering sulphate or alkali exerts an essential influence, although at present the question cannot be fully answered.

Under these circumstances a theory is advanced by the author which may be considered as not entirely absurd. We know that the estimate of the color of a body is different according as it is in a state of minute division, or in that of a compact solid form. Thus brown iron ore gives a dirty yellow powder; and a brownish piece of gum Arabic will produce a perfectly white powder; and so forth. It is extremely seldom that the reverse is noticed, viz., that the powder is darker than the mass; such is the case with the colorless diamond, which gives an ash-grey powder. The author is of opinion that the change of white oxide of zinc to that of a yellowish white, from increase of temperature, may probably be owing to a change in the state of its molecules, somewhat resembling that of incipient fusion; and he hoped to have been able to have determined this point by the help of the microscope.

* In the same manner, Mohr converts carbonate of magnesia into pure magnesia.

With this view a portion of carbonate of zinc, which had been ascertained by the usual tests to be free from any trace of iron or other metallic impurity, was placed in a porcelain dish over a spirit-lamp, and constantly stirred until it became so hot that a test-portion added to dilute sulphuric acid gave off no bubbles of gas—a point which speedily occurs. This preparation had the same snow-white color as the pure carbonate. Placed under a microscope, having a magnifying power of one hundred and twenty, the separate particles of the powder were easily observed; under this power they appeared as globules of about the size of pins' heads, frequently smaller, seldom larger, never exceeding 1-140th of a line in diameter: their form was changed by moisture. The parts that were moistened were distinguished from the surrounding powder by a distinct pale yellow color.

The oxide was now heated for a quarter of an hour; when quite cold it was no longer of snowy white but milk white; the difference could readily be appreciated by a comparison with the pure oxide. Magnified a hundred and twenty times, the particles appeared opaque, smaller than before, and often arranged in a string-like form. There were also observable numerous yellowish-brown particles dispersed among the yellowish-white mass. When magnified three hundred times the globules were transparent—the oxide remained the same after it had been heated half an hour, one hour, and two hours. Between a quarter of an hour and two hours the oxide undergoes absolutely no change, neither to the naked nor to the assisted eye.

The author considers that he has thus made an approach towards the solution of this riddle, although the above theory should not be confirmed or should even be controverted. There can be no doubt that the yellow discoloration retained by the oxide after cooling is owing to the yellowish-brown particles scattered throughout the mass. It still remains to discover the nature of these granules in order to answer this long-debated question of the cause of the yellow color of the oxide of zinc prepared by heat.

It has been above observed that the carbonate of zinc operated upon had been found pure by the usual reagents. By testing, it was examined for iron, lead, cadmium, and copper; the acidulated solution of the hydrochlorate with sulphocyanuret of potassium,

and hydrosulphuric acid, were added without producing any result. Possibly manganese might be present, which, in only slight traces, it is well known, is not easily detected. In the burnt oxide, manganese must be present in the state of oxyduloxide: if, therefore, this be converted into a muriate, chlorine must be present, and this will exert a solvent action on gold-leaf simultaneously exposed to its influence; faint traces of gold in solution may be indicated by chloride of tin, and the author trusts that in the cases of the presence of manganese that he may obtain a decisive reaction. At first the muriatic acid employed, with a possible admixture of free chlorine, was tested by digestion with gold-leaf, but with negative results. In the next place, one loth (equal to half an ounce) of the burnt oxide of zinc was dissolved in the same hydrochloric acid which contained gold; and the vessel being closed by a glass stopper was set on one side for twenty-four hours. Chloride of tin produced no change in the solution, even after several hours' exposure to the action of warmth. Dr. Wittstein employed also a very sensitive test for manganese, first proposed by Crum, and which he has himself frequently found useful, viz. a solution of the oxide in nitric acid, to which is added a small quantity of the brown binoxide of lead, heat being applied; manganese being present, hypermanganic acid is formed, and the fluid becomes reddened. By this test, however, no manganese was discovered, and the author therefore concluded that the oxide of zinc was free also from this impurity.

Dr. Wittstein repeated his experiments for the detection of other metals, upon larger quantities of the oxide, as in his earlier researches. Half an ounce was dissolved in excess of hydrochloric acid, and hydrosulphuric acid passed through the solution for a long time—it produced not the slightest disturbance. Again, half an ounce of the oxide was dissolved in hydrochloric acid, which had not shown any change on the addition of sulphocyanuret of potassium, and on the then employment of this reagent, a faint red discoloration showed the presence of slight traces of iron. The extraneous admixture, which was shown to be present by the aid of the microscope, consists also of oxide of iron, but in such minute quantity, that of all its tests the sulphocyanuret of potassium alone manifested its presence.

From all the preceding, the author considers it fair to infer, that when the oxide of zinc, after being heated, acquires a yellowish tint, it proceeds from the presence of a slight trace of oxide of iron. Clearly, however, no explanation is hereby furnished of the cause of the citron-yellow color of oxide of zinc which attends its heated condition and disappears on cooling. This phenomenon is purely physical, and must be classed with numerous similar phenomena, *e. g.*, the blackening of oxide of mercury by heat, and so forth.—*Pharm. Jour.* 1852, *from Vierteljahresschrift für praktische Pharmacie*, 1852.

Varieties.

General Report upon the Results and Effects of the "Drug Law," made to the Secretary of the Treasury. By C. B. GUTHRIE, M. D.—The act of Congress, approved 26th of June, 1848, entitled "an Act to prevent the importation of spurious and adulterated drugs and medicines," having now been in existence and enforcement almost three years, the working of the law, and its effects, immediate and remote, have become necessarily matters of fact, and are no longer left to conjecture and speculation.

At the time of the passage of this law by Congress, no inconsiderable fears were entertained by its friends, and great hopes by its enemies, that it would be found impracticable to carry out its requisite provisions without great injury to that portion of our citizens engaged in the importation of this class of merchandize, in which event its repeal would, of course, have been urgently solicited.*

In entering upon the duties of the commission, which I had the honor to receive from the department, I was fully impressed with the importance of the information sought for, and the necessity of a candid, impartial and unbiassed examination of facts bearing upon the subject, and in making to the department this report, I have divided my results and facts into immediate and remote; the reasons for which will appear in the detail. Under the general terms drugs and medicines, are embraced all articles intended for the treatment of the diseases of the human system, and though they admit of many subdivisions, these terms, included under the two heads

*Strong *prima facie* evidence of the popularity of this law may be found in this significant fact that not a petition for its repeal has ever been presented to Congress.

of chemicals and compounds, and crude drugs, are all that is necessary for my purpose in speaking of the effects and applications of the law.

First, with regard to the effect upon chemicals and compound medicines: Previous to the passage of this law, no restriction was laid upon any class of medicines coming in under this head. If the importer paid the requisite duty, no questions were asked, no limit was fixed as to quality or condition. It needs no argument, but merely a mention of the fact, to show that any compound medicine or chemical preparation may be so made as to deceive the unsuspecting and uneducated, and even very often the druggist, apothecary, physician and all, because they were not in the habit of analysing their articles, and were deceived by their external, often times very fine appearance. Under the combined influence of competition and avarice—two strong temptations—the manufacture of articles of this class had become systematised, and on purpose to supply the United States market.

The immediate and positive beneficial results of the law may be seen in the fact that now very few, if indeed any, spurious or sophisticated chemical preparations, for pharmaceutical purposes, are even offered at our ports, or by any possibility find their way into our markets. Manufacturing chemists and importers of this description of medicines, finding it impossible to get such goods through our custom houses, will, of course, not risk the loss of bringing them here, but in their stead will import such as are known to come up to our required standards. Under this general head of chemicals, may be included a large majority of the manufactured and compound medicines used in practice by the medical faculty, and all the most important usually purchased by others for domestic uses, more especially in the west and south, where every man, almost, is obliged to learn the uses and doses of calomel, blue mass and quinine, &c. The certainty of purity in these articles alone, is a matter of no small moment to the community at large; of the probabilities of their home adulteration I shall also refer to elsewhere.

A few articles of this class may now and then, either through culpable negligence on the part of the inspector, or by being entered under a false name, be imported, but they must be few, and are daily growing less. An instance of this kind has occurred in New York, where a large lot of sulphate of lime was offered in market, under the name of precipitated chalk. The New York College of Pharmacy, standing very properly as the guardians of the public health, and protectors of this act, for which they had petitioned and which they had agreed to support, by committee, reported the fact, and warned the holders of the consequences of continuing to sell the article as a medicinal preparation, upon which they very readily withdrew it. How it came into the city that committee have never been able to ascertain; whether imported under the head of plaster of Paris, and thus escaping the eye of the inspector, or whether passed by him, or at some other port, without due test and examination, I am not able to say. That it was imported under a false name is to my mind the most likely of all.

If our Colleges of Pharmacy in the different cities, as I have no doubt they will, continue to thus watch the articles offered them and the public, and act with the independence that has characterised them thus far, no deception of this kind will go long unexposed, and it will soon cease altogether.

No manufactured article, susceptible of adulteration, ought ever to be suffered to pass by the Examiner of drugs without being *sampled* and tested by analysis, and no matter what its appearances or what its label; neither the one nor the other are guarantees of its purity, for both may alike be counterfeits. The more popular the maker, the higher his name and reputation, the more likely his name, label, bottle and article to be counterfeited, as has Pelletier's name to the article quinine, others to iodide of potassium, &c. &c.

Secondly. The effects of the law upon crude drugs and medicines, such as leaves, barks, roots, gums, gum resins, &c. Upon these articles the effect has been the same as upon chemicals and compound goods. Greater variations must of course occur in their qualities, as many of them cannot be tested with accuracy; and of the rest, very imperfect standards are to be found in any of the works on pharmacy or materia medica now extant. This was heretofore left entirely in the hands of the examiner at each port, who has been obliged to fix his own standards when there were none laid down in the works referred to in the instructions of the department. Such has been the case with many of our most valuable and important articles of crude drugs, gums, and gum resins,—such as opium, scammony, &c. Such also has been the case with many of the roots and barks, as rhubarb and cinchona and all its varieties. One may have fixed upon five per cent. of morphine, and another upon eight, another ten, as the standard for opium. Again, the same might occur in admitting or rejecting scammony. One requiring sixty or seventy per cent. of resin, another admitting or rejecting, merely from the physical appearance of the article.

So again with regard to barks, especially the cinchonas—one refusing to admit any except the true medicinal article; another admitting Maracaibo and other false barks usually sold in market as pale bark, or used to adulterate that article. But, upon the whole class of crude drugs, the effect has been highly beneficial. Greater care is taken in their selection and preparation for market, and a vast quantity of many kinds of barks and roots heretofore finding daily their way into market, either in their simple worthlessness or mixed with purer and different articles, are now scarcely, if ever found; and if seen they are about the last of their kind. Now and then, an article may get through our ports, by some adroit means of deception, or be slipped in at a port where there is no examiner, but this must be but seldom. But recently, in New York, I saw several casks of gum guaiac, the heads of which, for about six inches, were filled with a fair article, while the remaining portion of the cask was made up of the vilest trash imaginable. This is but a shallow trick that could not be often repeated, for though

it might deceive the examiner (as it did not) it would meet detection in the hands of the jobber, who would not fail to claim damages from the importer at once. Another mode of evading the law, is by sending sample packages to the examining office, or such cases as are known to be all right, and getting the whole invoice passed by them. This can only be guarded against by the examiner being always upon the alert, and where there is the least doubt, refusing to pass anything except what he sees and knows to be correct as to quality. The facility with which this fraud may be practised, led the convention of the Colleges of Pharmacy to recommend that every package should be examined; an opinion, I then and now fully concur in. Many similar instanes, both in regard to chemicals, chemical preparations and all sorts of crude drugs, might be given, but they have no bearing upon the object of this report, only as they point to a necessity for the law's continuance.

Another immediate result of the law is the exclusion of damaged drugs. Heretofore no state of damage or decay, whether little or much, prevented an article, either manufactured or crude, being thrown into market and sold for whatever it purported to be, whether calomel half oxydyzed, iodide of potassium one-third deliquesced, rhubarb one-half rotten, senna in a similar or worse condition from being soaked with salt water—they were each sold under their original names, and found their way into the hands of the buyers of *cheap goods*, either in that state or powdered or re-bottled, re-labelled, and done up good as new. The importer got his drawback of twenty-five, fifty, and seventy per cent. of duty. The insurance company sold the goods and paid the difference; bargain getters purchased; the physician prescribed; the apothecary dealt out, and the patient, suffering under the pains and ills of lingering disease, swallowed; all but the last got their pay, while the poor man who bore the unrighteous accumulation of the whole, cursed his physician for not understanding his complaint, and perchance turned his face to the wall and died. This is no fancy sketch, but true, every word of it, and more than once acted out in the drama of every-day life.

Under the proper construction and administration of the law, all this will and is now mostly prevented. It must be evident that any article of medicine essentially damaged, is not fit to be given to the sick as a remedy. This is a very important point, and all examiners should be careful to enforce it strictly, regardless of the specious plea of interested insurance companies or individuals, for any other construction for their general or especial benefit or relief.

In few words then, may be summed up the immediate effects of this law: A purer and better class of chemicals and compound preparations, a material improvement in the quality of crude drugs imported, such as gums, barks, roots, leaves, and an almost entire exclusion of damaged and decayed drugs from our markets.

These results are, in themselves, sufficient to mark the law as one of great value, and to entitle it to a sure claim for perpetuity, and its provisions to

a steady enforcement. But they are by no means all that it has accom plished. Its remote or secondary effects, which I propose to point out, are equally important, and they are found in the influence upon our home manufactures and trade.

It has often been claimed that the law was a tariff for protection to home adulteration, and while we shut out the evil in one way, we were equally exposed to it in the shape of home preparations; were this even true, it is no argument against the law for keeping out foreign adulteration, as it is very evident that if both are equally bad, no pure medicine can be had by those who require them, while if we are certain the foreign are pure, we have a choice between the pure and the sophisticated. But I am satisfied that the amount of home adulterations have been over estimated, and that under the effect of this law they are decreasing daily, and perhaps mainly because the demand is decreasing.

I have never believed, though it has been again and again asserted, that our medical gentlemen to any great extent, who buy and use most largely of this class of goods, have desired to buy and use inferior medicines, because they were cheap, and my own direct intercourse and observation, as a druggist for five years, aside from a six years' experience in the profession, has satisfied me of the correctness of my views. I speak of the country at large. Wherever it has been the case, it has been the result of ignorance, as to the appearance and physical properties of drugs that has led them into this error, an error in which, from a like ignorance, they have been kept by their druggist, who has been imposed upon by the bland assurance of the importer or jobber, which led him to take all things of a like name as of the same quality. There are those who buy because cheap, and prescribe, and perchance hope for success in the use of such remedies, but they are not found among our medical gentlemen of education and character and entitled to the respect and confidence of the community at large. The flood of light thrown upon this subject of adulterations of medicines by the reports to Congress; by the report of Dr. Bailey, special examiner for the port of New York; reports to the American Medical Association, and by various other writers in our pharmaceutical and medical journals, through the newspapers of the day, and various other means, to the people, has worked and is working a revolution in the drug trade at large. By a desire and growing necessity for a proper education of pharmaceutists and druggists, a man is no longer considered competent to sell, dispose and deal out medicinal articles affecting the health, life and happiness of his fellow-beings, simply because he can calculate a per centage, or make a profit.

The reform in this department is, I know, but just beginning, though long needed, but it will progress, for public opinion demands, and will continue to demand it.

Physicians, professors of materia medica, and teachers of practical pharmacy and chemistry are feeling it, and the whole course of teaching upon this and kindred branches, has received more attention from both professor

and pupil within the two past years, than ever before in the same length of time in the United States. From these combined sources will continue to flow a light that must shine upon and enlighten that ignorance which was permitting men to tamper with the life and health of the community. This has also had the effect to create a demand for pure medicines. Rhubarb is no longer rhubarb unless the quality is such as to commend it to the unfortunate consumer; and calling a thing by a good name is no longer sufficient to redeem it from its lack of curative properties and consequent worthlessness.

Again, the endeavor to come up to the law's standard for chemicals, the competition with the imported article, the increasing demand for good medicines, together with a commendable emulation among our chemists, has produced an improvement in this class of goods, sufficiently visible to refute all charges of home adulteration because protected from foreign competition; besides this, they are our fellow citizens, within reach of our complaints, with no intermediate dealer to shift the blame of impurity to the other side of the ocean, and thus wash his innocent hands at our cost. With this and the spirit of inquiry as to what we are selling, what we are buying, what we are administering, what we are swallowing with hopes of relief, that is abroad, no man can long escape detection, exposure and consequent loss of business, if engaged in the manufacture or sale of spurious goods.

These opinions are the result of the concurrent testimony of the different examiners, of various dealers in drugs throughout the country, from whom I had before and since my appointment to this commission been in receipt of information, and are fully borne out by my own extensive observation in almost every State in the Union.

Without inquiring or pointing out the cause, the testimony to this effect, that the quality of drugs in general has improved much within the two past years, is almost universal; and a style of drugs and chemicals, and of medicinal preparations, may now be found on sale in our great commercial emporiums, of a quality and purity never before found, certainly not in the United States, and I question if anywhere else.

These are the results of my observations, both as to the remote and immediate, or special and general effects of the law. And I feel that the friends of the law have great reason to congratulate themselves and the community at large, upon the fullest realization of their hopes as to the good accruing from these sanitary measures.

Those who were reaping an iniquitous harvest either through a desire to do evil for the purposes of gain (if any such there could have been,) or through ignorance of the extent of such evil, must themselves feel that the law has worked no wrong to them even though it may have forced them into a different channel of trade. The only ones from whom we shall hear any complaints while the law is carefully and judiciously executed, or

from whom we shall hear the plea for "unrestricted commerce," and the potency of the great laws of trade as in themselves sufficient for the protection of life and health, are those whose prototypes aforetime cried out "Great is Diana of the Ephesians."

The value of their opinions may be measured by the sincerity of their professions, and the weight of their testimony calculated by the percentage of their gains.

I have pursued my inquiries among drug importers and jobbers, meeting both friends and enemies of the law; among retail apothecaries, professional men and their patients, and my conclusions are that no more popular act stands upon our congressional record.

I have only to add my sincere wish that it may long stand as a mark of the enlightened wisdom of the age and nation.—*N. Y. Jour. Phar. Sept.* 1852.

[The above report is but the general report upon the working of the law. It was, we understand, accompanied by a second private and detailed one, regarding the manner in which, at different localities, the law has been carried out.—EDITOR N. Y. JOUR. PHARM.]

On the Preparation of Anhydrous Acetic Acid. By M. CHARLES GERHARDT.—The author states that he has succeeded in preparing anhydrous acetic acid in a state of perfect purity, and giving by analysis numbers exactly agreeing with those calculated from its formula. It is obtained by mixing perfectly dry fused acetate of potash with about half its weight of chloride of benzoyle, and applying a gentle heat, when a limpid liquid distils over, which, after being rectified, has a constant boiling point of 279° F., is heavier than water, with which it does not mix until after it has been agitated with it for some time. It dissolves at once in hot water, forming hydrated acetic acid.—*London Chem. Gaz.*, June 5, 1852.

Estimation of the Quantities of Free Acids in the Juices of Fruit. By M. GRÆGER.—The juices under examination are mixed with neutral tartrate of potash, and the amount of free acids calculated from the quantity of bitartrate of potash which separates. To determine the amount of free tartaric acid in a juice, a second portion is divided into two equal parts; the one is neutralized with potash, and the other half of the juice now added, and the amount of acid calculated from the quantity of precipitated bitartrate of potash.—*London Chem. Gaz.*, from *Jahrb. für Prakt Pharm.*, xxiii. p. 293.

Mixtures for Colored Fires. By Prof. MARCHAND.—The following re cipes for the preparation of mixtures for colored fires were found among the posthumous papers of the late Prof. Marchand. The materials are ubbed to a fine powder separately, and then mixed with the hand:

Red.

61 p. c. chlorate of potash.
16 sulphur.
23 carbonate of strontia.

Purple-red.

61 p. c. chlorate of potash.
16 sulphur.
23 chalk.

Rose-red.

61 p. c. chlorate of potash.
16 sulphur.
23 chloride of calcium.

Orange-red.

92 p. c. chlorate of potash.
14 sulphur.
34 chalk.

Yellow.

61 p. c. chlorate of potash.
16 sulphur.
23 dry soda.

or,

50 p. c. nitre.
16 sulphur.
20 soda.
14 gunpowder.

or,

61 p. c. nitre.
17½ sulphur.
20 soda.
1½ charcoal.

Light Blue.

61 p. c. chlorate of potash.
16 sulphur.
23 strongly-calcined alum.

Dark Blue.

60 p. c. chlorate of potash.
16 sulphur.
22 carbonate of copper.
12 alum.

Dark Violet.

60 p. c. chlorate of potash.
16 sulphur.
12 carbonate of potash.
12 alum.

Pale Violet.

54 p. c. chlorate of potash.
14 sulphur.
16 carbonate of potash
16 alum.

Green.

73 p. c. chlorate of potash.
17 sulphur.
10 boracic acid.

Light Green.

60 p. c. chlorate of potash.
16 sulphur.
24 carbonate of baryta.

For Theatrical Illumination.

White.

64 p. c. nitre.
21 sulphur.
15 gunpowder.

or,

76 p. c. nitre.
22 sulphur.
2 charcoal.

Red.

56 p. c. nitrate of strontian.
24 sulphur.
20 chlorate of potash.

Green.

60 p. c. nitrate of baryta.
22 sulphur.
18 chlorate of potash.

Pink.

20 p. c. sulphur.
32 nitre.
27 chlorate of potash.
20 chalk.
1 charcoal.

Blue.

27 p. c. nitre.
28 chlorate of potash.
15 sulphur.
15 sulphate of potash.
15 ammonio-sulphate of copper.

The dark blue is rendered still darker by the addition of some sulphate of potash and ammonio-sulphate of copper.—*Chem. Gazette*, May, 1852, from *Journ. für Prakt. Chem.*, liv. p. 250.

New Method of Effecting Crystallization. By M. Payen.—Having observed the phenomena of the crystallization of sulphur on the surface of vulcanized India Rubber, in which case it appears to pass in solution from the interior of the mass and to be deposited there in consequence of the evaporation of the solvent, I was induced to seek the means of increasing the size and regularity of the crystals obtained from different substances, and especially those of little solubility.

I have attained this object by a simple arrangement of apparatus, through which a liquid circulates, which, in one part, dissolves the substance to be crystallized, and in another and cooler part deposits it in a crystalline state. The apparatus consists of a flask or tubulated receiver, surmounted by another vessel of a similar kind, the necks of which are connected, and the lateral openings of which communicate by tubes, the one with the top and the other with the bottom of a vessel placed at some distance. The inverted receivers are both filled with the substance to be dissolved, and the whole of the apparatus with the solvent. Heat derived from a constant and uniform source is applied to the receivers, by which a continued circulation of the liquid is maintained, and this being saturated in the most heated part of the apparatus, is conveyed to the cooler part where the deposition takes place.

Crystallization may thus be made to take place slowly and regularly, so as to produce crystals of considerable size, even from slightly soluble substances. By using benzole and sulphur, I have been enabled in this way to obtain crystals a hundred times larger than those formed in the usual way. *Pharm. Journ.*

On a new Saccharine Substance contained in the Berries of the Mountain Ash. By J. Pelouze.—The berries of the mountain ash contain among other substances malic acid, bimalate of lime and glucose. The great acidity of this fruit does not admit of our supposing the existence in it of cane-sugar. The crushed berries yield a juice which soon begins to ferment, and furnishes a vinons liquid of a very acid, and by no means agreeable taste, which in some districts is used as a substitute for cider.

The experiments of Piria on the transformation of asparagine or malamide into succinate of ammonia, those of M. Dessaignes on the conversion of malic acid, or of malic acid combined with lime, into succinic acid, led me to suspect that the latter acid might be readily obtained by the action of the atmosphere upon the juice of the berries of the mountain ash. I was disappointed in my expectation; no succinic acid could be detected in some juice which had been exposed for more than a year, but I found it in a new kind of sugar, which I propose to call *sorbine.*

Preparations of Sorbine.—The berries collected towards the end of September were crushed and pressed in linen; the juice was exposed from thirteen to fourteen months in some dishes, during which time several de-

posits and mouldy vegetations formed in it, which were not examined. The liquid, which had spontaneously become clear, was decanted, evaporated at a gentle heat to the consistence of thick syrup. This syrup deposited some dark brown crystals, which were completely decolorized by being twice treated with animal charcoal.

Sorbine contains no water of crystallization; it can be fused without parting with any water. With chloride of sodium it forms a compound which appears to crystallize in cubes. Sorbine is colorless, of an intense sweet taste, so that in this respect it cannot be distinguished from cane-sugar. The crystals are quite transparent, hard, grate between the teeth like sugar-candy, of spec. grav. 1·654; at 59° F. they are rectangular octahedra, belonging to the system of the right rectangular prism. Water dissolves nearly twice its weight of this sugar; boiling alcohol takes up but very little, and again deposits it in crystals on cooling. A concentrated solution of this sugar resembled completely one of ordinary sugar; the saturated syrup had a density of 1·372 at 59°. Sorbine and its syrup are therefore both somewhat denser than in the case of cane-sugar. Sorbine cannot be set in fermentation by yeast at 68°–86°; dilute sulphuric acid does not alter its properties, and does not render it fermentable after being boiled with it for half an hour, nor does this treatment change its behavior towards polarized light. Concentrated sulphuric acid immediately attacks it; the sorbine first turns reddish-yellow, and then with a gentle heat is converted into a black mass; nitric acid converts it into oxalic acid, with copious evolutions of red fumes; like cane-sugar, it furnishes more than half its weight of oxalic acid. On analysis it furnished 40·000 per cent. carbon, 6·66 hydrogen, and 53·34; and its formula is either $C^{12} H^{12} O^{12}$ or $C^{12} H^{9} O^{9}$.—*London Chem. Gaz.*, from *Liebig's Annalen*, March, 1852.

On Dyeing with Sandal-Wood. By Anton Winner.—In order to dye as fine a red with sandal-wood as with madder, the author first exhausts the wood with boiling water. He then treats it with a cold filtered solution of chloride of lime as long as this becomes colored, and washes it perfectly with pure water. From the sandal-wood thus prepared the red coloring matter is extracted by a hot, but not boiling solution of soda, the wood being tied up in a linen bag; the kettle is to be covered with a well fitting lid. The extract should have a deep red color tending to violet. Cotton, linen, and woollen stuffs are prepared with acid mordants, and dyed in it in the usual manner. The author obtained a beautiful scarlet by alternately treating the stuffs with a mordant of chloride of zinc and the above bath. The colors are durable, and particularly useful in saving cochineal, as stuffs which are to be dyed with cochineal may previously receive a ground of the coloring matter of sandal-wood.—*Ibid*, from *Kunst und Gewerbebl. für Baiern*, 1852, p. 149.

Process for giving various Objects a Pearly Lustre. By O. Reinsch.—To produce the iridescence of mother-of-pearl on stone, glass, metal, resin'

paper, silk, leather, &c., Reinsch adopts the following process:—2 parts of solution of copal, 2 parts of that of sandarach, and 4 parts of solution of Damara resin (equal parts of resin and absolute alcohol) are mixed with half their volume of oil of bergamot or rosemary. This mixture is to be evaporated to the thickness of castor oil. If this varnish be then drawn by means of a feather or brush over the surface of some water, it will form a beautiful iridescent pellicle. This film is now to be applied to the objects which are to be rendered iridescent. The vessel in which the water is contained, on which the pellicle has been produced, must therefore be as large as, or larger than, these objects. The water should have about 5 per cent. of pure solution of lime added to it; its temperature should be kept at about 72°. The objects are dried in the air.—*Ibid*, from *Kunst und Gewerbebl. für Baiern*, 1852, p. 165.

Researches on the Constitution of Organic Acids. By M. Charles Gerhardt.—The experiments described in this communication were instituted with the view of establishing a general formula for organic acids, which should be to them what the formula for ammonia is to the organic alkalies. The author believes that water, the molecule of which he assumes to consist of 1 atom of oxygen and 2 atoms of hydrogen, may be taken as the type of organic acids, the two atoms of hydrogen being capable of being replaced by simple metals, or by complex groups, such as methyle, æthyle, &c. Reference is made to the results obtained by Dr. Williamson and M. Chancel, tending to prove that alcohol, ether, and their homologues, represent molecules of water in which the two atoms of hydrogen are partly or wholly replaced by complex groups; in accordance with which theory the compound formed by replacing 1 atom of hydrogen in alcohol by potassium may be considered as the potassium salt of a weak acid, æthylic acid, which gives rise to a chloride (hydrochloric ether or chloride of æthyle) when acted upon by perchloride of phosphorus. Reference is also made to the experiments of Cahours, proving that various organic acids, such as benzoic, nitrobenzoic, cuminic, anisic and cinnamic acids, experience similar changes under the influence of the same reagent.

Starting from this point, the author concluded, that, by imitating the well-known reaction æthylate of potassium on chloride of æthyle, but substituting the corresponding compounds of one of the above mentioned acids for those of æthyle, the anhydrous acids ought to be obtained—a result which was fully confirmed by experiment. With benzoate of soda and chloride of benzoyle the experiment succeeded perfectly well when conducted in the following way:—The soda salt was well dried and mixed with an equivalent weight of the chloride, and the mixture heated to 130° Cent., when it formed a limpid liquid, which at a temperature a few degrees higher underwent decomposition, the peculiar smell of the chloride of benzoyle disappearing, and chloride of sodium being deposited. The product, suspended in cold water, and washed with carbonate of soda, left a white substance without

odor and perfectly colorless, which was found on analysis to be *anhydrous benzoic acid*—

$$C^{14} H^5 O^3.$$

This new product crystallizes in oblique prisms, which melt at 33° C. It is volatile without decomposition, insoluble in water, but soluble in alcohol and ether, and these solutions are perfectly neutral. Boiling water transforms it by degrees into common benzoic acid.

Experiments were made in the same direction with other acids, the detailed account of which the author defers for a future communication.—*London Chem. Gaz.*

Note on Sarsaparilla. By Dr. F. L. Winckler.—Chatin finding iodine in Honduras sarsaparilla, believed that the remedial action of that root might thus be partially explained. Dr. Winkler has carefully examined several other varieties without success, and has been led to think that the root examined by Chatin must have been exposed to the action of sea-water. —*Central Blatt,* May 7th, 1852.

On Coccus Ilicis. By Dr. X. Landerer.—The *Coccinella septempunctata* is known in the East by the name Κρεμεστι, and the Coccus Ilicis by that of Πρινοκοκκι, the tree on which the latter insect is found, and from which it is collected, being called by the Greeks *Prinos,* that is the *Quercus coccifera.* As this tree occurs abundantly in Greece, and principally in the mountainous parts, these insects are also found here, but it is only in Peloponnesus, and almost exclusively in the neighborhood of Messena, that the inhabitants collect them. The insects are found adhering to the bark of the branches of this tree, and also immediately above the root, but very rarely on the leaves, and it is observed that those found near the roots of the tree are larger, and contain more coloring matter than the others. An active man may collect from six to ten ounces in a day. With the view of increasing the number of these insects, the people burn the small trees on the mountains, and in consequence of this bad management, sometimes set fire to whole forests. The ashes appear to fertilize the ground, and to be very favorable to the growth of the trees on which the insects are found. The Coccus looks like a small egg, which can hardly be distinguished on the young branches, to which it is attached by an envelope. In about three months it acquires the size of a pea. If the insects are not collected at the proper time, that is, about the middle of June, they burst the envelope and escape, leaving only the envelope, which is valueless, as it contains none of the coloring matter. The collectors cut off the branches on which the insects are found, with a hooked knife, which is made for the purpose, and afterwards separate the insects, which, still mixed with some of the leaves and flowers of the trees, constitute the first rough article of commerce. They are immediately exposed to the sun on sieves, by which means they are killed and preserved. The size varies according to

the vigor of the trees from which they have derived their nourishment. After being dried, the insects are separated from the leaves and other foreign matters with which they were mixed, and packed in small casks, in which they are transmitted to Marseilles, Malta, &c. The principal consumption of them is in the East, where they constitute the principal material used for coloring the red head-dresses used by the men in these countries. In order to increase the weight of the insects, they are sometimes sprinkled with red lead, which fills up any cavities, and red sandal-wood, and pea-flour, covered with a decoction of the insect, are also used for the same purpose. I have been assured by dealers in the article, that three or four per cent. of such adulterations may be added without their being easily detected. The insects collected in the above-named localities, are considered to be of better quality than those obtained from any other parts. About 40,000 pounds weight of them are annually collected in Greece. Those of the best quality sell at from 20 to 30 drachmas per pound. There is an inferior quality, which is sometimes exported in powder, but as this is more or less adulterated, there is little demand for it. This rarely finds its way into European commerce, but is generally sent to Tunis, where it is used with madder for dyeing the red turbans or head-dresses, of which great quantities are sent from Tunis to all parts of the East, and it is said that the color produced at Tunis is more durable than that produced by the Greeks. I have only to add, with regard to the medicinal use of these insects, that they are employed as a remedy for different diseases, especially scarlatina, and that they are administered in the form of infusion and of electuary.—*London Pharm. Journ.*, June 1, 1852.

On Gambir. By Berthold Seemann.—Black pepper (*Piper nigrum*, Linn.) and Gambir (*Uncaria Gambir*, Roxb.) are grown in great quantities in Singapore, and exclusively by the Chinese, for both these articles are so exceedingly cheap that Europeans have not deemed it worth their while to engage in the speculation. Pepper and Gambir plantations are always combined, because the refuse of the Gambir-leaves serve as an excellent manure for the pepper; and moreover, what is of equal, if not of still greater importance, kills the Lalang (*Andropogon caricosus*, Linn.) a plant which, like the couch-grass (*Triticum repens*, Linn.) spreads with astonishing rapidity over the fields, growing so close together and so high, that within a short space of time valuable plantations are rendered useless, and many have to be given up from the utter impossibility of freeing the ground from this weed.

The process by which Gambir is extracted and prepared is simple. The leaves are boiled in water until all their astringent property is extracted. The decoction is then poured into another vessel, in which it becomes inspissated, and, when nearly dry, is cut into small square pieces,

and thus brought into the market. M'Culloch states that sago is used in thickening it. This, however, at least in Singapore, is not the case; but, instead of sago, a piece of wood is dipped into the vessel, by which the desired effect is produced. It must, indeed, be an extraordinary substance, the mere dipping of which into the fluid can cause it to become a thickened mass. I was very eager to obtain a piece of this wood; unluckily, the Chinaman whose laboratory I visited, could not be persuaded to part with his, and a friend of mine, who was exerting himself to procure a sample, had not succeeded at the time of the Herald's departure; he promised, however, to send it to England, accompanied by the Malayan name, and specimens of the tree.—*Ibid.*, from *Hooker's Journal of Botany*.

On the Production of Photographs on Glass. By J. Pucher.—According to this process, a thin film of iodide of sulphur is formed upon plate glass, which must be perfectly clean, with a very thin coating of sulphur, and then impregnating this for a few seconds with the vapor of iodine. The glass plate is then placed in the camera, where at the same time the vapor of some quicksilver in an iron cup in the bottom of the camera acts upon the iodide of sulphur with which it is coated, and it receives the photographic image within a minute. The glass plate, when taken out of the camera, only exhibits a trace of the picture, but this immediately comes out on exposure to the action of the vapor of bromine. If the picture be now held over alcohol, and some of the same liquid be poured upon it, it will be fixed. Not more than from five to eight minutes are required for the whole operation.

The glass plates must be breathed upon and well rubbed with a soft linen rag several times before use. They are coated with sulphur by burning sulphur sticks, made on purpose, in a proper tube, and holding the plates over it at a distance of about 3 inches. These sulphur sticks are prepared by dipping pieces of rush-pith into a melted mixture of sulphur and mastic, with which they become incrusted. For use, these sulphur sticks, which are about the size of a lucifer match, are stuck on a brass needle, introduced into the middle of a glass tube and kindled, so that the vapor of the sulphur may come in contact with the glass plate held over it.

These glass plates are so sensitive, that the coating of iodide of sulphur becomes instantly changed on exposure to direct sunlight, and give a Moser's image within five minutes when laid in a book. The figures thus obtained are most easily read by candle-light. In daylight, the blue letters can be recognized on the yellow ground only by looking through the plate towards the middle of the window, or towards a sheet of paper fastened in that place, the sulphur not having been removed either by vapor of bromine or by alcohol.

If a glass plate covered with a solution of gum and exposed to the vapor of iodized sulphur, be placed in the camera, a positive picture, with all its

details, is obtained, the outlines of which can be laid bare by an etching-point capable of scratching the glass. If a glass plate, so marked, be rubbed in with printing ink, the outlines will be filled, and the ink will remain in them when the glass is freed from the coating of gum by means of water. The picture is then easily transferred to paper, which is to be laid on the plate and rubbed over with a paper-knife.—*London Chem. Gaz.*, from *Archiv der Pharm.*, lxix. p. 301.

On Gallic Acid Fermentation. By M. Robiquet.—Gall-nuts contain, besides tannin and the several principles which have already been pointed out by chemists, pectose and pectase. The latter ferment, which exists both in the soluble and in the insoluble state, acts at the same time upon the pectose and upon the tannin, converting the first into pectine and the second into gallic acid. The presence of water and a temperature of 77° to 86° F. are requisite for this reaction, which resembles in every respect the ordinary phenomena of fermentation.

The ordinary tannin, which has been prepared with ether, contains sufficient pectase to pass spontaneously in the presence of water into gallic acid; but if care has been taken to purify it, or if its solution has been simply boiled for a few minutes, the change no longer takes place.

Synaptase, yeast, vegetable and animal albumen, and legumine have a very doubtful action upon tannin, and retard rather than accelerate its conversion into gallic acid.

It is quite as easy to convert the pectine of fruits into pectic acid by means of the pectase obtained from gall-nuts, as to convert tannin into gallic acid with pectase separated from the juice of fresh roots, and especially from turnips.—*London Chem. Gaz.*, from *Comptes Rendus*, July 5, 1852.

On the Manufacture of Gas from Wood. By Dr. Pettenkofer.—Two years ago, Dr. Pettenkofer showed by experiment, at a meeting of the Polytechnic Institute of Bavaria, that a very considerable amount of illuminating gas could be disengaged from 2 oz. of wood. Its practicability on a large scale has since been the subject of much doubt. The inventor's process is now in operation at Basle, and it is also about to be introduced at Zurich, Stockholm and Drontheim. The process is said to be far less expensive than the manufacture from fossil coal, and furnishes a gas which is free from sulphuretted hydrogen, and several useful collateral products, as charcoal, wood-tar and wood-vinegar.—*London Chem. Gaz.*, from *Central Blatt.*, March 10, 1852.

On the Galbanum Plant. By F. A. Buhse.—The author states, that in his travels in Persia he discovered the plant which yields galbanum. In June, 1848, he found it on the declivities of the Demawend. It is a ferula, from the stalks of which a liquid issues abundantly, by the odor and nature

of which he immediately recognized galbanum, and his guides assured him, moreover, that galbanum is gathered from this plant. The author has not yet distinctly determined the plant. It appears to differ from *Ferula erubescens* (*Annales des Sciences*, iii., Sér. 1844, p. 316) only by the absence of commissural vitæ; but as neither Aucher-Eloy nor Kotschey, who have both collected the Ferula erubescens, make any mention of its yielding galbanum, the author is in doubt whether his plant be the same, or a variety of it. Don's genus Galbanum (Trib. Sibrinæ) and Lindley's Opaïdia (Trib. Smyrneæ) do not agree with the plant seen by Buhse, unless thatboth of these authors have made their descriptions from imperfect fruits, or that there exist other plants which yield galbanum. The plant which Buhse describes is called, in some parts of Persia, *Khassuch* (not *Kasneh*, which means Cichor. intybus, nor Gäshnis, which is Coriand. sativum), and appears to be confined to certain districts of Persia. In the whole large district of the Elburs-chain, from the south-east angle to the south-west angle of the Caspian Sea, it is only found in the neighborhood of the Demawend; but here at an elevation of from 4000 to 8000 feet, and even on the declivity of the top of the Demawend. It exists neither on the mountains of Talysch, nor in the districts of Caradagh and Tabris. It is said to re-appear on the Mount Alwend, near Hamadan, and in the neighborhood of the great salt-desert. Near Hamadan Aucher-Eloy has gathered his Ferula erubescens, and this supports the supposition that the author's plant is the same. In the salt-desert itself Buhse did not meet with it again. The inhabitants of the Demawend collect the gum-resin, which issues spontaneously from the lower part of the stalk; they do not make incisions in the plant; but it is not at this place that the galbanum is collected for commercial purposes. When fresh, the gum-resin is white like milk, liquid, and somewhat glutinous. In the air it soon becomes yellow, elastic, and finally solid. The odor is rather strong, unpleasant, and similar to that of our commercial galbanum.—*London Pharm. Journ.*, from *Central Blatt, für* 1852, No. xiii.

Improvement in the Quick Process for Manufacturing Vinegar. By ANTON WIMMER.—Instead of wood shavings, Wimmer employs in the manufacture of vinegar, pieces of charcoal of the size of a walnut, and which have been deprived of their saline matter by diluted muriatic acid, and afterwards washed with water. The charcoal effects the oxidation of spirit of wine in a much shorter time than the wood, and is not so soon spoiled by the formation of mother of vinegar. With charcoal, the operation can be performed, even on a very small scale, and vinegar may thus be prepared in glass bottles.—*London Pharm. Journ.*, from *Pharm. Central Blatt.* 1852, No. xiv

Editorial Department.

The Convention of 1852.—The following call to the Convention about to meet in this city is introduced, notwithstanding the few days that will elapse before the meeting to which it points:

"Notice—The annual meeting of the U. S. Pharmaceutical Convention will take place in Philadelphia, on Wednesday, the 6th of October, 1852.

It being a matter of much importance that this meeting should number as many of our Druggists and Chemists as possible, I deem it proper to suggest that not only all regularly incorporated and unincorporated associations of this kind should see that they are fully represented, but that where no associations exist as yet, the apothecaries should send one or more of their number as delegates to the Convention,—such will, no doubt, be cheerfully admitted to seats in the Covention.

We trust all who feel an interest in this important subject, will remember the time and place, and give us their assistance in person or by delegate.

C. B. Guthrie, *President of Convention.*"

The following resolutions have been passed by the Board of Trustees of the Philadelphia College of Pharmacy, Sept. 20th.

"Resolved, That the hall of this College be placed at the disposal of the Pharmaceutical Convention about to assemble in this city during the time they may need it.

Resolved, That a committee of three be appointed to make arrangements for the convenience and comfort of the members of the Convention whilst they are in session."

The Committee of Arrangement consists of Wm. Procter, Jr., Alfred B. Taylor, and Edward Parrish, to whom members of the Convention desiring information are invited to apply.

The Hall of the College is in Zane street above Seventh, a central location, and well fitted for the purpose. As no hour was set in the minute of adjournment last year, it is proposed that the time shall be four o'clock P. M., on the 6th of October, which will admit of our New York and Baltimore friends leaving home in the morning. As there will have to be a preliminary meeting of delegates only, the full sittings will probably commence on the morning of the 7th, when the consideration of the important subjects of future organization, Pharmaceutical Education, Pharmaceutical Ethics, and the means for the advancement of pharmaceutical science, will come before it.

The New York Journal of Pharmacy.—The Editor of the New York Journal of Pharmacy deems it an unusual course on our part to notice, under the head of "Pharmaceutical Notices," a series of articles of the same general character which appeared in that Journal, with comments. We disclaim all intention of discourtesy or unfairness in thus remarking on the articles in question, our only reason for abridging them being to comprise them within a reasonable space. It is due to Messrs. Coggeshall and Dupuy that their explanations and reclamations should be presented to our readers, and we give them below.

Comments on "Comments."—The American Journal of Pharmacy, (Philadelphia) for July, contains "Pharmaceutical notices, being extracts from various articles in the New York Journal of Pharmacy, with comments by the editor," in which our friend Procter, criticises, rather severely, some of the pharmaceutical formulæ and suggestions that have been offered in this Journal. With full respect for the great acquirements and high character, as a practical pharmaceutist, to which my friend Procter is justly entitled, I should have been glad if the articles, upon which he comments, had met his approval; and I know of no one that I would rather should set me right, if anything that I have offered does not find acceptance with him. With the greater part of his comments, I do not think there is occasion for controversy,—matters of fact readers can judge for themselves, and it certainly is of little consequence, who may be found in error, compared with the elucidation of truth.

In respect to the *consistence* of Syrup of Gum Arabic, he is probably nearer right, (during this hot weather, at any rate,) than I was, and still, I think he is not right. My experience with the present officinal formula, had been in the cold season, when I found the syrup decidedly too thick for convenient use, especially by itself; a large proportion of it crystallized in the temperature of the shop, and the mouth and neck of the bottle choked up with candied syrup every two or three times it was used. I had found the former syrup to answer very well in regard to consistence and flavor, though, it certainly could not be considered permanent; it had to be made in small quantities and frequently; indeed, I do not suppose that any liquid combination of gum, sugar and water only, can be made of a permanent character. Since reading Mr. Procter's comments, I have made this syrup again by the present formula, and it does keep decidedly better at this season, than that made in the other proportions, yet not perfectly; and there is considerable crystallization, even in the very hot weather we have had lately. I infer that syrup which crystallizes at this season, has an excess of sugar in it, the crystals formed tending further to reduce the remaining syrup and thus sooner promote acidity than if a proportion of sugar had been used which could remain in solution. Perhaps, a medium between the two formulæ could be hit upon, in which the proper balance might be better attained.

In the formula offered for Compound Syrup of Squill, in our Journal for April, there is an error of four ounces in the quantity of honey, which should have been *twenty-two* ounces. Whether it was made by the printer or not cannot be ascertained, as "the *copy* has been destroyed." I had not noticed it until my attention was called to it by Mr. Procter's comments. The quantity of sugar used by me in making this syrup was, for convenience, one pound avoirdupois weight; that of honey, one pound and a half, same weight. In transcribing the formula for a medical journal, I thought I must, per custom, render it in troy weights; so as 15 oz. troy are 200 grs. more than one pound av., I set down 15 oz., and intended to set down 22 oz. of honey, as being only 60 grs. more than one pound and a half av. I think this addition of 4 oz. of honey will make the whole come up to Mr. Procter's measure of "56 fluid ounces before the ebullition," &c., and a little over. The boiling can be continued only for a few minutes. I was formerly in the practice of boiling to three pints, and adding 18 grs. tartar emetic, but finding that I had to evaporate more than half a pint, and judging that the strength of the resulting preparation was rather lessened than increased thereby,

I concluded to stop at three and a half pints. As to the proportion of sugar and honey, they amount to $2\frac{1}{2}$ pounds av., which, with two pints of an evaporated menstruum, containing the extractive matter soluble in diluted alcohol of 8 oz. of the roots, furnishes a syrup of good consistence. It may be observed, that solution of sugar in a menstruum so charged, is quite different from that in water. Perhaps, however, an equal amount of sugar with that of the honey, would be preferable. I can only say, that I employed the same quantity a number of times, but reduced it several years since, because it appeared to be too much for some reason, the particulars of which I do not recollect. And as this formula has always given me a satisfactory preparation, I have thought no more about it, until now. Or perhaps, it would be better to continue the evaporation to three pints, with the advantage of producing a more symmetrical result, corresponding, at the same time, with the quantity of the Pharmacopœia. But, is not the officinal formula "almost as far out of the way" the *other* way? Forty-two oz. of sugar in forty-eight fluid oz. of syrup! Can such an amount remain in solution twenty-four hours at any ordinary temperature? If mine is an "*anomaly*," is not this an *impossibility*, "in point of consistence?" In reference to the alcoholic objection, it may be remarked, that the evaporation in the case commented upon, is not "from 4 pints of tincture to 2 pints," but from $4\frac{3}{4}$ pints to 2 pints. The small portion of alcohol, that may remain after this evaporation and the continued heat to the end of the process, can scarcely be of serious consequence in the doses in which it is proscribed; it may have some influence in preserving the syrup, and also in promoting its medical action. Be all this as it may, so far as taste is a criterion, this preparation appears to be of at least double strength in the qualities of both roots, of the officinal syrup carefully made by the second process given,—the first being, as I suppose, with all apothecaries of the present day, "an obsolete idea."

G. D. C.

There are details applicable to many of the processes of our National Pharmacopœia, which are left to the knowledge and judgment of the apothecary. To be otherwise would make that work more a treatise on practical pharmacy than a pharmacopœia, and in all countries it has been left for commentators to point out many things which should be known to the operator who uses it as a guide, yet we believe that a little more minuteness of detail in some of the formulæ would be useful. In preparing the syrups of the Pharmacopœia requiring heat, many operators forget to make allowance for the loss by evaporation, which usually occurs when open vessels are used. If it was more the custom to employ the saccharometer, and add water to make up for the deficiency of menstruum, or to perform the operation in close vessels, so that the vaporized moisture should be returned to the syrup, as well as to strain them in covered vessels, and finally to keep the syrups as near the temperature of 60° F. as is practicable, we think there would be less cause to complain of the separation of sugar from the officinal syrups, or of their fermenting.

We have not found the sugar to separate from Syrup of Gum Arabic to much extent, even in cool weather, by o serving these rules. There is a small excess of solid matter in that syrup, but the gum retards the crystallization of the slight excess of sugar, and it is better to have that excess than a fermenting syrup.

As regards compound Syrup of Squill, we are satisfied that the proportion of sugar is correct, and that it will remain dissolved, unless the temperature is reduced too low: or a part of the menstruum lost by evaporation:

or a portion of alcohol be present; in either of which cases the sugar will tend to separate. The substitution of sugar, for honey, was generally esteemed an improvement. We should be glad if our friend Coggeshall could find the pharmacopœia sufficiently near *right* in these, as in many other instances, to claim for it his support.

Remarks on the Comments made by the Editor of the American Journal of Pharmacy, on some extracts from various original articles, published in the New York Journal of Pharmacy.—After giving the formula for preparing Stramonium Ointment, as modified by E. Dupuy, the editor of our cotemporary adds, "the objection to the officinal formula on the score of color, is hardly valid, and if it was so, it would be better to color it with extract of grass, than to substitute a preparation which will constantly vary in strength and appearance or with the age of the leaves. The officinal extract of strammonium is easily incorporated with lard, and produces a brown colored ointment of comparatively uniform strength." We do not pretend to have furnished a formula vastly superior to that received in our officinal guide. But as we were writing for our locality chiefly, and knowing the general expectation and usage of furnishing stramonium ointment of a green color, we have given a formula which does furnish an ointment having the proper strength, requisite color, without the loss of time and material necessarily incurred in manufacturing a color ad hoc as suggested by W. Procter, Jr., which from the contamination of the decomposed chlorophylle of the extract, would never comparefavorably (notwithstanding all that useless waste of trouble,) so far as its appearance is concerned, with the far readier mode proposed for transforming at once by a few short manipulations the dry strammonium into an alcoholic extract and ointment without liability to alteration during the process. Respecting the keeping of both ointments, we can affirm that the one prepared by the modified formula, will keep as well if not better and longer than the other, and as the color is a point of some importance for our public and practitioners, we are satisfied that it will be preferred on the score of economy of time as well as for its color, which is desirable at least within our circle of custom.

Emplastrum Epispasticum with Camphor and Acetic Acid.—Mr. Procter objects to the addition of acetic acid to the officinal blistering cerate, and seems to smile at the idea of fixing by it the volatile principle of the cantharis, which, by the way, he gratuitously makes the author to say is a neutral substance, when he says not a word about it. He quotes the authority of Mr. Redwood, who in the Pharmaceutical Journal, October, 1841, speaks of acetic acid as not being a good solvent for cantharidine. The reason is, in all probability, from the fact of his using the London standard strength, which is but 1.48. For Messrs. Lavini and Sobrero, (Memoire lu a l'academie des sciences de Turin, 9 Mars, 1845,) state that "concentrated acetic acid dissolves cantharidine, but more readily under the influence of heat." Respecting the volatility of cantharidine, these same chemists have stated in the same paper "that while manipulating with but 52 grammes of flies, for the researches they were making on cantharidine, one of them suffered from blisters produced on the face and lips by the emanations from these insects." Besides their authority, Soubeiran, in his Traite de Pharmacie, and Dorvault in the Officine, both state that cantharidine is a very volatile substance, even at ordinary temperature, and if that is, as it appears to be, the case, what reliable information have we that only 1-30th of a grain was volatilized in the experiment mentioned by W. Procter, Jr., made with 100 grs. of powdered cantharides? Is it not very probable, that in removing the hygrometic water, much more was lost.

Whatever may be the changes which take place by the addition of acetic acid in a concentrated state, it is a fact, proved by experience, that the blistering plaster thus prepared keeps better—that is, retains its power longer than the officinal one even exposed to the air in thin layers. As an example of the stability of this combination we have *Brown's Cantharidine*, which, to all appearance, is made from an etherial extract of cantharides additioned with concen-

trated acetic acid and incorporated in melted wax. We find such a mixture, although spread on paper and but imperfectly protected from the air, retaining for a long period its vesicating properties. Is this advantage produced by a simple acid saponification of the cerate, without reaction on the active principle, but that of protecting it from atmospheric influences? We think it probable that there is a modification taking place, both on the cantharis and other components of the cerate. E. D.

In reference to Mr. Dupuy's Stramonium Ointment we have little to remark. In the United States Pharmacopœia this ointment is viewed as an extemporaneous one, to be prepared when prescribed, as the small proportion of the ingredients will indicate. In regard to the medicinal activity of Mr. D.'s ointment we perhaps should not undertake to decide; yet we have some reason for doubting the efficiency of an oily menstruum for malate of daturia, inasmuch as the ointment, made carefully according to the United States Pharmacopœia of 1840, can be eaten with avidity by mice. When the extract of stramonium leaves of the Pharmacopœia, which Mr. D. should recollect contains no chlorophylle at all, much less "decomposed chlorophylle," is incorporated with eight times its weight of lard, we *know* that the strength is there.

In relation to Mr. Dupuy's remarks on our criticism of his blistering cerate, we will refer him, and those who may feel any interest in the matter, to the article on Cantharides at the beginning of this number. We are willing to commit the applicability of the facts therein contained to the subject at issue, to the candor of Mr. Dupuy, believing that they bear us out in the positions taken, that acetic acid does not fix cantharidin, and that that principle is not so volatile as some authors have stated it to be. We quoted Mr. Redwood in opposition to the solubility of cantharidin in acetic acid. How far he is incorrect will be seen in the paper at page 295. If Mr. Dupuy, at line third of his article on blistering cerate, (New York Journal of Pharmacy, vol. i. page 72,) does not term cantharidin a "*neutral substance*," we will have to believe that the copy of that journal in our possession is not genuine.

Richmond Pharmaceutical Society.—In answer to a query respecting the progress of that Society, we have received the following communication from one of its members. It is very gratifying to witness thus early the good results of a harmonious effort of a small body of apothecaries, because it is an encouragement to similar efforts in other communities.

"We are happy to be able to announce that this Society went into successful operation about three months ago. A constitution and by-laws have been adopted. Meetings of a purely scientific character are held regularly once a month, on which occasions members, appointed for the purpose, read essays upon pharmaceutical subjects. The first of these, an essay on the process of displacement, illustrated by numerous painted diagrams of apparatus, was read at the September meeting. Scientific discussions are also held.

A committee has been appointed to form a library for the Society; and another to obtain specimens of the Materia Medica.

From the enterprise and zeal its members have already exhibited, it is not too

much to hope that ere long Pharmacy will have in this Society an advocate that will prove valuable in advancing pharmaceutical interests, in promoting a knowledge of of the sciences connected with pharmacy, and in elevating the standard of practice.

The following are the officers of the Society:

President—ALEXANDER DUVAL,
1st Vice do.—JAMES P. PURCELL,
2d do. do.—J. B. WOOD,
Recording Secretary—CHAS. MILLSPAUGH,
Corresponding do.—S. M. ZACHRISSON,
Treasurer—W. S. BEERS,
Librarian—J. TAYLOR GRAY.

Delegates to the National Convention at Philadelphia.

ALEXANDER DUVAL, JOHN PURCELL, JOSEPH LAIDLEY."

A PROPER REBUKE.—Some months ago, we noticed the promulgation of a code of ethics, modelled after that of our College, by the Richmond Medical Society, which was signed by all the apothecaries of Richmond, but two. One of these, in a recent advertisement widely circulated on the cover of a quack pamphlet, uses the following language: "The Richmond Pharmaceutical Society, lately organised here for the purpose of higher education, promotion and interchange of knowledge, as well as for the purposes to free the Apothecary from the slavish laws dictated to him by the members of the medical society, an act which would not have been tolerated in a Monarchy, much less in a Republic, have honored me with the appointment of secretaryship for European correspondence; I am therefore placed in a situation to remain always well informed of new inventions made in Europe, in our art."

The Society, justly indignant at such a base use of their name, passed the following resolutions, which we cut from the "Richmond Republican" for August 30th, 1852:

"At a meeting of the 'Richmond Pharmaceutical Society,' held at their rooms on Friday evening, the 27th August, the following resolutions were unanimously passed:

1. *Resolved*, That the use, by any member, of the name of the Society, to give expression to his personal feelings towards physicians or others, is highly improper, and will meet with our unqualified disapprobation.

2. *Resolved*, That the use of the offices of the Society by any of its officers for their personal benefit, is highly reprehensible and deserving the severest censure and penalties. ALEX. DUVAL, President.

CHAS. MILLSPAUGH, Rec. Sec.

PHARMACY IN PORTSMOUTH, VIRGINIA.—No real progress can be expected in the pharmacy of a place where physicians compound their own prescriptions. On the contrary, the separation of pharmacy from the practice of medicine is a sure indication of the advancement of the former. We give place to the following extract from a Portsmouth paper, forwarded to us by Mr. Campbell, a graduate of pharmacy recently located in that town, with the more pleasure that it evidences such an improvement in the condition of our art, that physicians are willing to give up the important

though troublesome business of extemporaneous pharmacy to the apothecaries:

To the Public.—The undersigned, practicing Physicians in the town of Portsmouth, after consultation, have come to the conclusion to discontinue the furnishing of medicines to their patients after the 15th of the present month. Patients will be required to procure the necessary medicines from the Apothecaries.

John P. Young,
J. N. Schoolfield,
Geo. W. O. Maupin,
John W. H. Trugien,
James Gregory Hodges,
John W. Garlick,
R. H. Parker.

American Journal of Pharmacy.—The Publishing Committee have recently examined into the condition of the stock of volumes of the Journal, and find that they can furnish sets from the 8th volume or (2d of the new series) to the present time inclusive, amounting to seventeen complete volumes. The first of the new series, or seventh from the beginning, is out of print. Anterior to that they can supply the 6th, 5th, 4th and 3d volumes of the old series, whilst the 2d and 1st are out of print. The Committee are desirous of purchasing copies of the 1st, 2d and 7th volumes, and will either pay the price of publication or exchange recent volumes for them. Believing that the Journal embodies a very large amount of valuable information, comprehending in fact a faithful record of the gradual developement of pharmaceutical science during the period of its issue, now twenty-four years, both in Europe and America, the Committee consider that no pharmaceutical library should be without it. They therefore now, for the first time, offer the back volumes to the 20th inclusive, at the reduced price of $1.50 each, nett, which places them within the reach of almost any man in business. Besides the abstract and applied science embraced in this work, a very large number of formulæ are contained in it, including many that, though not officinal, are more or less valuable and in use. They therefore hope that the attention of the recent subscribers will be attracted to the subject, and that they will be induced to complete their sets as far as practicable.

Library of the Philadelphia College of Pharmacy.—Owing to the pecuniary difficulties which for many years past, this institution has been laboring under, its Library has in a great degree been neglected. In view of the present brighter aspect of its affairs, the Library Committee have solicited and obtained from the Board a moderate appropriation, to be devoted to the Library in the way chiefly of binding and completing works. As in a pharmaceutical library old works of the 18th, 17th and 16th centuries are particularly appropriate, as forming a fund of authorities useful to investi-

gators, the Library Committee now make the appeal to the members, and others who may feel interested, who have in possession works of the kind, that they do not particularly value, asking their donation to the College. The Committee in doing so believe that many valuable stores of volumes may be thus placed where they will prove useful, instead of mouldering away in garrets and closets almost unknown to their possessors.

The Committee also hope before long that they will be able to commence a system of annual purchases of standard works bearing on pharmacy, which will give greater practical usefulness to this important though long neglected department of the institution.

THE CABINET.—It has been but a few years since the attention of the Board of Trustees was directed to the importance of having a museum of specimens in Materia Medica, Chemistry, Botany, and Pharmacy, belonging to the institution, as a fit depository for the donations which from time to time have been received, and as a collateral advantage to the School of Pharmacy. The Committee having charge of the subject have partially availed themselves of the opportunities that have presented for getting contributions. They hope that the many graduates of our College who are scattered over the country will remember to forward to them objects of interest, which will prove useful and interesting.

The *Herbarium* of the College, though just being commenced, bids fair to be a valuable collection.

DIE POLYTECHNISCHE CENTRALHALLE is the title of a weekly scientific journal, published in Leipsic, a specimen number of which we have received from Fr. W. Christern, 232 Chestnut street. As its name indicates, it is designed for artisans and manufacturers, and its subscription price is very low. Dr. Kerndt, of the University of Leipsic, is the Editor.

Among the contents of this number we notice—

Note on natural soda.

On the means of obtaining sugar from the sugar-cane and beet.

On the solders for workers in metals.

On a machine for grinding colors.

On the preparation of flax.

On paper from refuse cotton.

On bleaching sponges.

On welding cast and wrought iron, &c.

THOMAS'S MECHANICAL LEECH.—The agents for this instrument, Harris, Hale and Co., have sent us a box containing two of these simple little instruments. Although called a "leech," it is in fact a tubular cupping instrument, with the mouth from one fourth to three fourths of an inch in diameter. Over the opposite end of the tube a sack of India rubber is tied

with wire, the sack entering the tube. In using the instrument the part to be "leeched" is scarified with a lancet, the rubber sack forced down into the tube by a plunger, so as to expel most of the air, and the open end then applied over the part. On removing the piston the contraction of the sack creates a partial vacuum, which acts on the scarified part, drawing the blood as in a cupping glass. How far it is capable of acting as a substitute for the disagreeable though effectual action of the little animal, we are unable to say, not having seen them tried. Several other forms of apparatus, on the same principle, are made by Mr. Thomas, as may be seen by reference to the advertising sheet.

Pharmaceutical Meetings.—The first Pharmaceutical meeting of the season took place on the 6th of September, on which occasion the meeting adjourned to meet on Tuesday the 5th of October, the evening previous to the meeting of the Convention, so that any members of that body who may be in the city may be invited.

We will take this occasion to remind the Members and Graduates of the College resident in Philadelphia, that the meetings will be held on the first Monday of every month following, to May next, inclusive.

The Delegates to the Convention, as far as heard from, are as follows:

Philadelphia College of Pharmacy.

Daniel B. Smith,
Charles Ellis,
William Procter, Jr.

New York College of Pharmacy.

George D. Coggeshall,
William Hegeman,
L. S. Haskell.

Massachusetts College of Pharmacy.

Joseph Burnett,
Samuel A. Colcord,
Samuel R. Philbrick.

Richmond Pharmaceutical Society.

Alexander Duval,
John Purcell,
Joseph Laidley.

Dr. Guthrie's Report was received too late to insert it among the selected matter in the fore part of the Journal, which will explain why it was put in small type under the head of *Varieties*.

We have received the following pamphlets from their authors:

Report made to the Hon. Thomas Corwin, Secretary of the Treasury, by Prof. R. S. McCulloch, of his operations at the Mint of the United States, in refining California gold by his zinc method.

Letter of Prof. R. S. McCulloch in reply to the report of the Director of the Mint.

An Address delivered before the Medical Society of Virginia at its 27th annual meeting held in Richmond, April 1852. By Beverly R. Wellford, M. D., etc. President of the Society.

Erratum.—At page 314, in the article "Pharmaceutical Apparatus," the first paragraph, second line, should read thus: "We described a mill intended for the apothecary's use, *by which comminution*, laboriously and," &c. The words in italics were accidentally omitted, and our readers will please to note the missing words on the margin.

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